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TROPICAL DISEASES BULLETIN

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Translated by
Lieut.-Col. J. A. WYLLIE, F.R.G.S.

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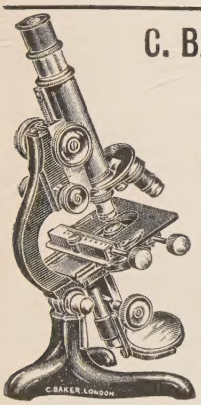

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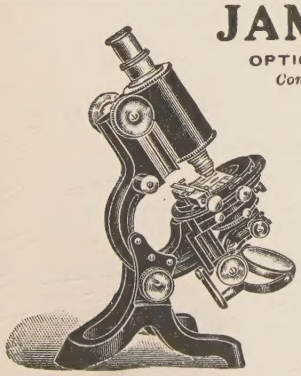

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 7.] 1916. [No. 5.

SLEEPING SICKNESS.

RODHAIN (J.). **La Maladie du sommeil dans l'Ouellé (Congo belge) à la fin de 1914.**—*Bull. Soc. Path. Exot.* 1916. Jan. Vol. 9. No. 1. pp. 38–72. With a map.

The conclusions of this paper are to the following effect :—

Distribution of Tsetse Flies.—Several species of Glossina are found in the Ouellé District, the most widespread being *Glossina palpalis* ; it occurs more or less numerously near the banks of all the large water-courses, in both the savannah and forest regions. It is usually abundant near rapids ; it may be absent near small streams or the remote sources of the big rivers ; in valleys where there is no woody vegetation or where this is replaced by papyrus it is absent. It is not found on the high plateau of the Aru. Tsetse flies of the *fusca* group are irregularly spread throughout the great forest, in the forest galleries of the Ouéré-Bili, and between the Ouellé and the Bomokandi. *Glossina morsitans* is found only in the eastern part of the territory between the Doungou and Garamba rivers, and to the north. [These points are shown in the map.]

Sleeping Sickness.—There are four foci of human trypanosomiasis. Two are situated on the western border in the Ibembo and Monga districts ; there is a third to the north connected with the M'Bomu epidemic [French Congo] and occupying the Ouéré-Bili district ; the fourth is situated to the east, round Aba. Besides these peripheral foci the disease has invaded the banks of the Ouellé River itself, there being a focus between Doungou and Souronga. Three small centres of localised infection are shown in addition on the map.

The spread of sleeping sickness in this region is mainly due to the movements of the human reservoirs of the virus and these are determined by causes which may be administrative, or connected with family or commercial intercourse. The two foci on the west are considered to be due to infected persons travelling for all these reasons ; the focus in the north came into being chiefly owing to family and commercial relations among the natives themselves. The Aba focus must be considered as dependent on the Yei epidemic, which was introduced by the soldiers of the Congo State and by Uganda porters accompanying merchants. The central infection of the Ouellé river owes its origin to infected persons in the service of the Government.

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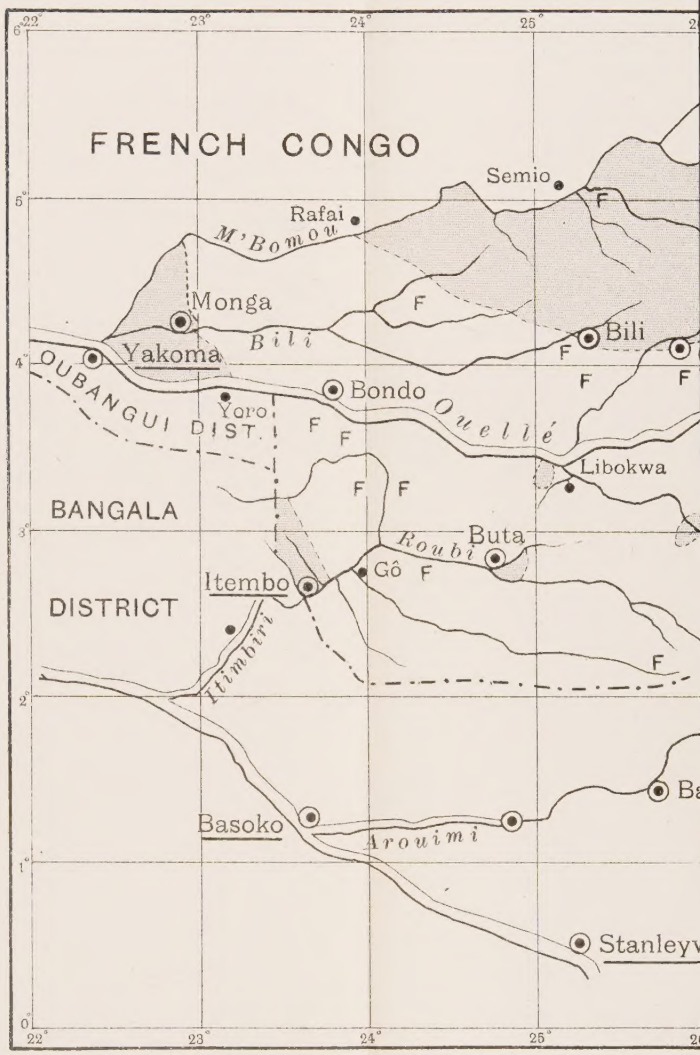
Prophylaxis.—Prophylactic measures have been conducted with vigour against these known foci. They have been based on knowledge of the etiology of the disease, are supported by regulations co-ordinating the administrative measures taken to hinder its extension, and are rendered possible by the increase in the staff of the medical personnel. A systematic census has been taken of the sick; they have been placed in hospital or treated at liberty according to their condition. Villages in dangerous situations have been moved and clearings have been made in places frequented by tsetse flies. The measures taken against the focus in the north had to be limited to protection of the menaced frontiers. The scarcity of doctors has up to recently hindered energetic action against the central focus which, owing to its geographical position, is difficult to deal with. The recent ordinance of September 1914 gives increased powers to doctors and district authorities but, to ensure the success of their efforts, the medical personnel should be reinforced and the surveillance needed to ensure the execution of the measures prescribed must be made more effective.—

Much of the paper is of local interest. For a long time the Ouellé (or Welle as it used to be written) District, in the north-east of Belgian Congo, was considered to be free from sleeping sickness though *G. palpalis* had been known since 1903 to exist there. It was not till 1912 that cases were found, and in consequence the author was deputed to study the distribution of the disease and devise measures for its control. He spent one and a half years within its limits (1913–1914). The map shows how far apart these lie.

After a discussion on the distribution of *G. palpalis* and *G. morsitans* and the *fusca* group the author deals in turn with the foci shown on the map. Detailed tables are given of the results of examination of the natives in each, nearly 300,000 in all. Thus in the Ibembo focus 15,871 were seen and 76 found infected. Here, to the usual causes of the return of old soldiers who had become infected elsewhere, and visits of fishermen, are added the position of the lazaret—in a place constantly frequented by Glossina. Attention is drawn to the protective role played by the rapids at Voro and Gô. These bar the passage of canoes and, in the author's opinion, have checked the spread of infection up the Ouellé and Itimbiri rivers. He indicates a danger point on the southern frontier near which, in the Nepoko basin, auriferous deposits have been found and are about to be exploited.

The last section deals with prophylaxis. On rivers where there are no steamboats and in a country without railroads, it is recognised that human carriers are responsible for the extension of the disease; they must be searched for and dealt with and the causes which lead to their travels must be studied. The three causes mentioned in the conclusions are discussed. To show the influence of the administration two instances are given: among 67 patients admitted to the Ibembo lazaret in two years 61 were soldiers or their women, and of these 59 came from other districts; and in the author's journeys he discovered 10 patients among the native troops, seven of whom were introduced cases. The influence of family and tribal relations is shown on the northern frontier, both sides of which are occupied by the Azande and, as the author rightly remarks, geographical frontiers rarely correspond with tribal frontiers. Among commercial reasons the chief is rubber

Chart of OUE
distribution of Sleep



REFERENCE.

- Sleeping Sickness areas.
- M Glossina morsitans.
- F Fusca group.
- Practically all the rivers shown are infested with palpalis.
- Observation posts.
- Lazaret.
- District Boundary.
- International Boundary.

LLÉ DISTRICT showing
ing Sickness at end of 1914.

Ordnance Survey, 1916.

collecting. The failure of the State, the ordinances of which were excellent, to control sleeping sickness is recognised to be due chiefly to lack of medical personnel. Other causes are that penalties for infraction of the laws were not severe enough, the apathy of the native chiefs, and the selfishness of traders. Excellent rules have been made for navigation and fishing but the surveillance is insufficient. As regards the Aba focus, which neighbours the Lado enclave where strict measures are in force, the author thinks that it will soon be extinct.

A. G. B.

BOUILLIEZ (Marc). **Contribution à l'étude et à la répartition de quelques affections parasitaires au Moyen Chari (Afrique Centrale).**—*Bull. Soc. Path. Exot.* 1916. Mar. Vol. 9. No. 3. pp. 143–167. With 6 text-figs & a map.

Human trypanosomiasis.—In an earlier paper the author has reported the presence of a focus of human trypanosomiasis in the Middle Shari district [see this *Bulletin*, Vol. 5, p. 86]. He has since had the opportunity of traversing a large part of this district and examining many natives. He has been unable to find patients infected with trypanosomes on any of the rivers excepting the Bahr Sara and a small focus, 25 kilometres to the west of Laï, on the Tendjibet river, in country which has been reoccupied since October 1914 [see map]. There is no trypanosomiasis at Laï itself. The presence at Fort Archambault of some women whom the war had brought from Goré enabled the author to examine them for trypanosomes, and several were found infected, showing that the disease exists on this part of the Penndé river. It is noted that the foci on the Penndé and that on the Bahr Sara join and are connected with the foci of the Ouahme, which is really only the Upper Bahr Sara [see this *Bulletin*, Vol. 6, p. 366, and map facing page 364]. In five villages, where the author is confident that he saw every native, 27 were found infected out of 565 examined. He has previously pointed to the numerous cases of importation amongst traders, boys, police and so forth. He notes now that a good number of traders coming from infected regions in the south avoid Archambault, going by other roads. He also says that the war has had a marked influence on the transactions and consequently on the comings and goings of traders, in consequence of the impossibility of their crossing Cameroon and going to Yola or Kano.

Cases of the disease which he has observed did not differ in their course from the classical descriptions. Not having been able, except at the end of his tours, to find *G. palpalis*, he made inoculations into various animals to see if he had to do with a species other than *T. gambiense*. The course of the infection in them was that of *T. gambiense*, but perhaps less virulent. Some of the monkeys lived a very long time and apparently recovered. They cite the case of a *C. patas* which was well after more than 14 months and other monkeys still alive after 9, 4 and 5 months. The infection is not acute enough for *T. rhodesiense*, but might be due to *T. nigeriense*, "if the slight pathogenicity for animals of a human virus is a character sufficient for the creation of a species." Morphologically the trypanosomes are identical with *T. gambiense*.

In the author's last journey, in September, he found some specimens of *G. palpalis* on the banks of the Moula river, and thinks if he had had more time the species would have been found elsewhere. *G. morsitans* he puts aside because it is common everywhere, whilst human trypanosomiasis is quite localised. The same is the case with *G. tachinoides.* He has begun tours of prophylaxis, making records of the patients and injecting 1 gm. of atoxyl as does OUZZILLEAU [this *Bulletin*, Vol. 6, p. 175]. He would make it obligatory for traders to go through certain places, where medical posts should be established.

Trypanosomiases of Animals.—Those examined were equines, bovines, sheep and goats. *T. pecaudi* is most common and is perhaps the only trypanosome acquired in the Territory. It is found in horses and donkeys and kills a great many. *T. cazalboui* and *T. dimorphon* have been found in animals passing through. Details are given of subinoculations with the last named trypanosome; dogs, cats, monkeys and a sheep became infected. Another trypanosome, found in a horse, belonged to the *dimorphon* group. It was smaller than the other and was inoculated without success into Cercopithecus monkeys, cats, rats and a genet. Some of the kids and dogs inoculated became infected. Its morphology, the author says, suggests *T. congolense, T. nanum*, or *T. pecorum.* [No measurements are given.]

A. G. B.

BOUET (G.). **Existence d'un petit foyer de trypanosomiase humaine à la Basse Côte d'Ivoire.**—*Bull. Soc. Path. Exot.* 1916. Mar. Vol. 9. No. 3. pp. 168–186.

In December 1914 trypanosomes were discovered in the blood of a half breed child who had lived *en pension* for four years at a school at Bingerville. With the exception of two cases in the preceding 12 months this was the first such discovery in the Lower Ivory Coast though *G. palpalis* abounds; cases previously found had been introduced from the north—the Upper Ivory Coast or the Soudan. By the Lower Ivory Coast the author signifies the part between the coast and the northern limit of the tropical forest. In consequence of this discovery he undertook a search for sleeping sickness in Bingerville and its neighbourhood. All the other children in the school were carefully examined but no cases of infection were found. Tsetse flies are not rare at Bingerville, and especially in the neighbourhood of the lagoons. Enquiry showed that the children of the school used to go for walks and bring back collections of insects, so that it appeared the child might have been infected on one of these occasions. A methodical examination was made of the natives in the neighbourhood of Bingerville. Out of 665 blood examinations there was one positive result—in a native of Adjamé, who had been born there and had only visited neighbouring parts of the coast. Numerous tsetse flies were collected at this village. It is noted also that the natives working in the palm groves are being bitten all the time. It is stated that the natives do not know the disease and have no name for it. The patient in whom trypanosomes were found was a man of 16 to 18; he had some mental symptoms and complained of headache, sometimes accompanied by fever, but there were no other symptoms, not even gland enlargement. Trypanosomes were only found in the blood on

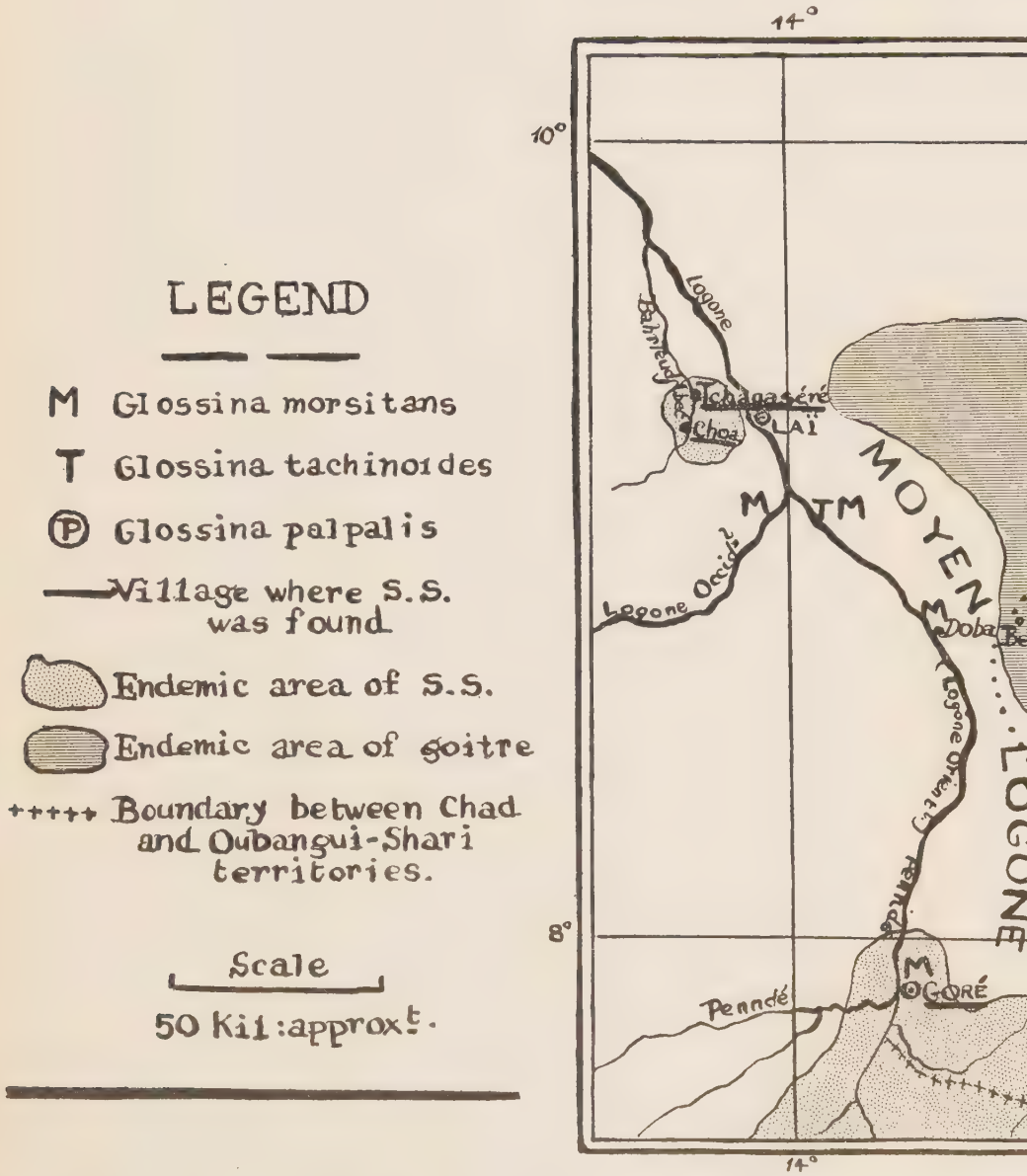


Chart of the Middle Shari District shewing the distribution of tsetse flies, sleeping sickness and goitre

16°
10°
8°
16°
LAC IRO
Bahr Salamat
CHARI
SALAMAT
Chari
FORT ARCHAMBAULT
Bahr Keita
Chari
Bahr Kô
MOYEN
Bahr Sara
Bemoli
Mandara
Gabou
Smai
Sanda
Lassa
Moula
Maudoul
Goundi
Quenoro
Ken
Gudikourou
Nana Baria
Bahr Sara
Gribingui

the first occasion. It is noted that since Bingerville was laid out numerous cases of trypanosomiasis have been found there; the author himself discovered a case in a late stage in 1906—a man who had been there for two years. Such cases have doubtless formed the reservoir of the virus.

The author examined a number of domestic animals, both those about to be slaughtered and those which formed part of the Government herd. *T. cazalboui* was found in a cow, which had probably been infected in the Upper Coast or the Soudan. No trypanosomes were found in 22 cattle of the Government herd; these were of the indigenous race. Of seven sheep one showed *T. dimorphon* and a horse showed *T. pecaudi*. The natives possess very few domestic animals. Two antelopes were examined with a negative result. The author concludes that there is little chance of the human trypanosome creating a reservoir for itself outside its normal host, man.

The author examined 458 *G. palpalis* for flagellates; these were found in 12. The salivary glands were in every case free. From the character and site of the infections they were assigned to *T. dimorphon* and *T. cazalboui*. The author does not think there is any serious fear of sleeping sickness becoming epidemic. The prophylactic measures recommended include the provision of sanitary passports for persons coming from the north and measures of deforestation against the flies. It is noted that the Comité Supérieur d'Hygiène of French Equatorial Africa has condemned the principle of segregation camps and shown that better results may be obtained by periodic sterilisation of the blood of the patients.

A. G. B.

JELLETT (J. W. H.). **Trypanosomiasis as a Cause of Irido-Cyclitis.**—*Ophthalmic Rev.* 1915. Vol. 34. pp. 41–44.

The case was that of a man employed in Northern Nigeria who returned in November 1913 suffering from "fever." In January 1914 his febrile attacks became less frequent and he went to Switzerland where his health improved, but he complained there of discomfort in the eyes. On his return the symptoms became more definite, there being at times congestion of the conjunctiva and episcleral tissues with tenderness and slight intolerance of light, and sometimes a slight rise of temperature. In May and October blood films were examined with a negative result and shortly after there was a well marked attack of irido-cyclitis in the right eye with marked keratitis punctata. The pupil dilated readily to atropine. In December the left eye became affected. Trypanosomes were then found in the blood. There was no other cause for the eye condition.

A. G. B.

Van den BRANDEN (F.). **Valeur moyenne de la durée de stérilisation sanguine chez les trypanosés par une dose de salvarsan, néo-salvarsan, salvarsan cuprique et sel sodique du salvarsan cuprique.** —*Bull. Soc. Path. Exot.* 1916. Jan. Vol. 9. No. 1. pp. 13–15.

The author, who writes from Leopoldville, decided to determine the mean period of blood sterilisation brought about by a single injection of each of the substances named in the title. A single dose

of any of them may lead to definitive cure and in most cases the blood is rendered sterile for some months. The patients were in good condition with normal cerebro-spinal fluid. The results are summed up in tables, wherein are set down the name and weight, the dose and date of injection, the date of the last examination after triple centrifugation, and the duration of blood sterilisation. He concludes that :—

(1) A single dose of salvarsan, 0·01 gm. per kilo of weight, produced in four patients blood sterilisation lasting 2, 7, 7, and 8 months.

(2) After a dose of neosalvarsan of 0·013 gm. per kilo there was no relapse after 4, 8, 12 and 22 months.

(3) Salvarsan copper, in doses of 0·004 gm. per kilo, sterilised for 19, 23, 23 and 24 months. (These patients were followed up for a long time.)

(4) In the case of the sodium salt of salvarsan copper, 0·0053 gm. per kilo, the periods were 8, 8, 12 and 12 months.

The paper does not deal with the rapid relapses which occurred in some cases.

The author thinks that the four substances are capable of rendering good service in tours for the treatment of sleeping sickness, taken at intervals of some months.

A. G. B.

MESNIL (F.) & BLANCHARD (M.). **Sensibilité au sérum humain normal de Trypanosomes d'origine humaine.**—*Bull. Soc. Path. Exot.* 1916. Feb. Vol. 9. No. 2. pp. 81–85.

The authors refer to a paper by MESNIL, summarised in this *Bulletin*, Vol. 5, p. 97, which dealt with spontaneous variations of susceptibility of a strain of *T. gambiense* to normal human serum. MESNIL employed mice and gave relatively large doses of serum. They refer also to a paper by LAVERAN, noticed in this *Bulletin*, Vol. 6, p. 381, who showed that a strain of *T. gambiense*, which had been kept up for 12 years in laboratory animals, was still resistant to human serum. LAVERAN's experiments were made with guinea-pigs and relatively small doses of serum. The authors thought it would be well to test the susceptibility of their strain of *T. gambiense* under conditions comparable with those of LAVERAN. They therefore made three series of experiments on guinea-pigs, which are tabulated. Varying doses of serum were mixed with 1/10 cc. of diluted blood rich in trypanosomes and the mixture was injected into the peritoneum of the pigs. The tables show that 1 cc. of serum caused in one case a longer incubation and a greater duration of the disease than in the control; in two other cases, with serum 48 hours old, the animal failed to become infected, and this was the result in six cases where 5 cc. were employed. These results show that this strain differed very markedly from that of LAVERAN.

They then retested on mice their own strain 11 years after it had been isolated from the human organism. The figures obtained showed that the susceptibility to human serum was still further increased; it was only a little less than that of *T. rhodesiense*. After an account of some experiments with the virus called *lanfranchii*, obtained from the human infection contracted by Professor LANFRANCHI, the authors record conclusions to this effect :—

Five strains of trypanosomes of human origin have been carefully studied from the point of view of their susceptibility to human serum.

Two strains of *T. rhodesiense* showed themselves, a short time after their separation from the human body, relatively susceptible to human serum. One strain of *T. gambiense* tested by LAVERAN remained insusceptible after 12 years' maintenance in laboratory animals. Another strain of *T. gambiense*, that of the authors, is susceptible, the susceptibility having been established for the first time seven years after separation from the human body. It was then slight; since then it has varied and is now, after 11 years, almost as marked as that of *T. rhodesiense*. The strain *lanfranchii* showed itself susceptible to human serum about two years after its isolation from man; its susceptibility is comparable to that of *T. rhodesiense* and to that of the authors' strain of *T. gambiense*.

A. G. B.

LAVERAN (A.). **Diminution de virulence chez des trypanosomes ayant subi un grand nombre de passages par animaux de même espèce.**—*Bull. Soc. Path. Exot.* 1916. Feb. Vol. 9. No. 2. pp. 109–117.

The author has often found that the virulence of trypanosomes kept up for a long time in the same species of animal, guinea-pig or mouse, becomes attenuated, sometimes so much that there is fear of losing the virus. The trypanosomes appear late in the blood of animals inoculated and multiply slowly, so that the blood examination is often negative. The infection lasts longer and longer with successive passages and at last recovery, which is never observed at the beginning, becomes more and more frequent. In such a case the only hope of preserving the virus is to inoculate a different species of animal. In this paper examples are given of these observations in the case of *T. congolense* and *T. gambiense*.

T. congolense.—In 1906 the author received a guinea-pig from BRODEN infected with this trypanosome; it has since been kept up in guinea-pigs and mice. At the beginning the incubation period in guinea-pigs was seven to eight days, and the average duration 14 days. In the case of mice the average duration was 105 days. Guinea-pigs always died and mice almost always. Since 1910 the duration has become sensibly longer and more and more mice have recovered. The histories of eight guinea-pigs, inoculated in 1914 and 1915, are given. In one instance a guinea-pig, which had probably recovered from a slight infection after six months, was reinoculated and died; it had therefore not acquired immunity. Other guinea-pigs which had slight infections lasting 6 and 10 months were reinoculated and had slight reinfections; they have now probably recovered. In the case of mice ten examples are given and in five of these the mice did not become infected at all; otherwise the details resembled those of the guinea-pigs. One mouse, which had recovered from a slight infection, was reinoculated and died; here again there was no immunity. The author, fearing to lose the virus altogether, inoculated a dog on two occasions from guinea-pigs with very scarce trypanosomes. After a very long incubation period the dog became infected and the author hopes to regenerate the virus.

T. gambiense.—The strain of *T. gambiense* had been kept up for over 12 years, almost always in guinea-pigs. The histories of eight guinea-pigs recently inoculated are given. Six of these are examples of slight infection followed by cure in five months to a year. One

guinea-pig reinoculated became infected and succumbed to the re-infection. Two guinea-pigs which had been inoculated from a guinea-pig with a negative result were reinoculated with success by the use of a virus which had undergone 13 passages in a rat. One of the pigs succumbed a few days later.

The author asks if something analogous to this attenuation of virulence is not taking place in the case of *T. gambiense* in man. Sleeping sickness is very serious in countries recently invaded; later it runs a much longer course and recoveries may occur. But here the question is more involved because there is an intermediate host—the tsetse-fly—and the flies may sometimes become infected from wild animals.

M. MESNIL in the discussion gave similar examples. Owing to its gradual attenuation in mice he lost the virus of dourine four years after he had obtained it from ROUGET. The same has occurred with another dourine strain obtained from the Liverpool School of Tropical Medicine. Analogous observations have been made with *Schizotrypanum cruzi*. In 1912 Blanchard's strain killed mice in 15 to 20 days; later, grown mice contracted a slight and chronic infection and now even young mice are recovering. A. G. B.

FIORI (C.) & DELANOË (M. et Mme P.). **Au sujet du dimorphisme du Trypanosome de Mazagan.**—*Bull. Soc. Path. Exot.* 1916. Feb. Vol. 9. No. 3. pp. 130–133. With 19 figs.

The authors refer to their previous note [see this *Bulletin*, Vol. 6, p. 377] in which they described the pathogenic trypanosome met with at Mazagan in a naturally infected horse. This trypanosome was dimorphic and the dimorphism had a tendency to become less at the first passage in the white rat, so that the authors thought that after successive passages in rats the trypanosome might end by becoming monomorphic. They say here that in the rabbit the tendency was the other way. They drew and measured 61 trypanosomes in the rabbit, 34 of which had no free flagellum. The maximum was 36·1μ, minimum 15μ, average 26·1μ. The trypanosomes of this rabbit had gone through two passages in dogs. In another rabbit inoculated from a white rat, which was inoculated from the horse, there was also a very distinct dimorphism. This morphological peculiarity seemed to the authors to differentiate this virus from the trypanosome of debab. Nineteen drawings of the trypanosome are given. A. G. B.

SHIRCORE (J. O.). **A Method for the Trapping of *Glossina morsitans* suggested for Trial.**—*Trans. Soc. Trop. Med. & Hyg.* 1916. Jan. Vol. 9. No. 3. pp. 101–102. With 1 plate.

The diagram illustrates the traps suggested by Dr. Shircore. They consist of canvas screens smeared with sticky matter arranged on iron rods at right angles to a central support and twisting with the wind. Each trap has a catching area of six square yards. A large number of these are placed in a cleared space across a caravan road and it is suggested that the porters should pass slowly through or rest there, so that the flies which leave them may be attracted to the screens. Forty traps have a catching surface of 240 square yards, one yard being allowed between any two traps. The method is based on the known habits of tsetse flies. A. G. B.

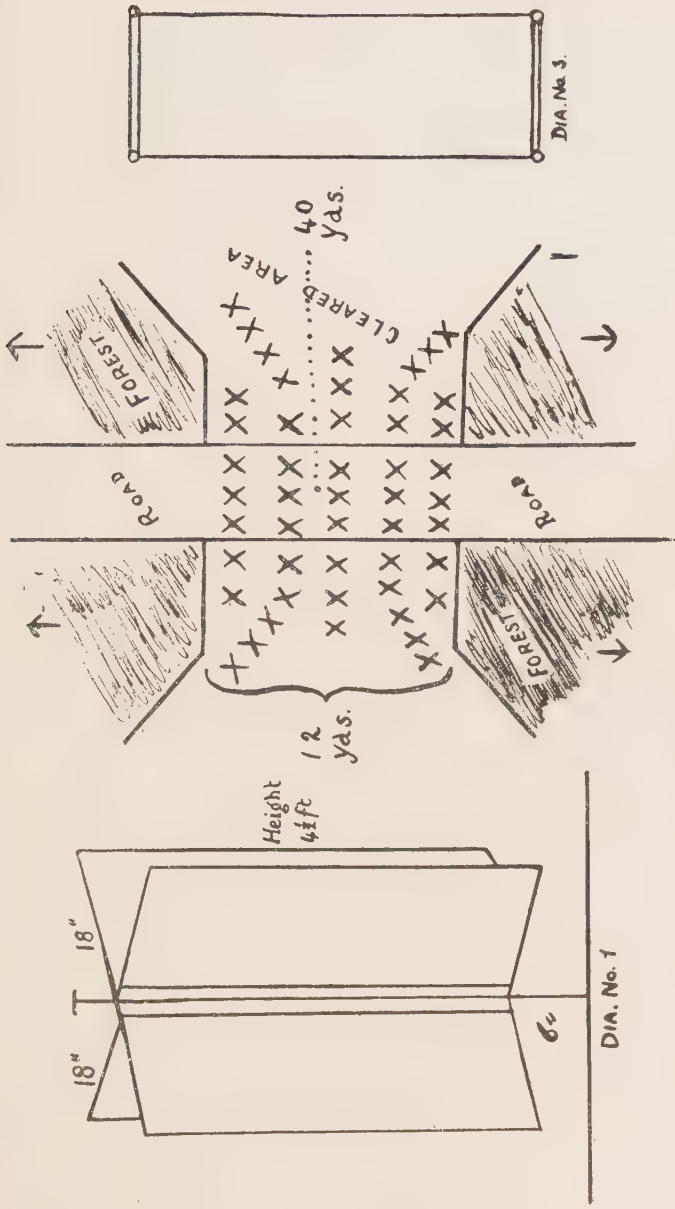
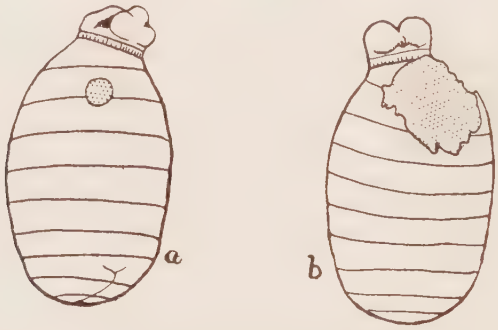


Diagram to illustrate Method for Trapping *G. morsitans*.

WATERSTON (James). i. **Chalcidoidea bred from** *Glossina morsitans* **in Northern Rhodesia.**—*Bull. Entomol. Res.* 1915. June. Vol. 6. Pt. 1. pp. 69–82. With 5 text-figs.

ii. **Chalcidoidea bred from** *Glossina morsitans* **in Nyasaland.**—*Ibid.* 1916. Feb. Pt. 4. pp. 381–393. With 9 text-figs.

The Chalcidoidea which are the subject of these papers were bred from puparia of *G. morsitans* collected in Rhodesia by LLOYD and EMINSON, and in Nyasaland by LAMBORN. They include six species, which are described with figures. The holes of emergence of two are shown.



Puparia of *Glossina* showing holes of emergence of: a, *Syntomosphyrum glossinae*, Wtst.; b, *Stomatoceras micans*, Wtst.

[A similar pair of figures is given by CARPENTER in his Progress Report on Investigations into the Bionomics of *Glossina palpalis* (*Reports of the Sleeping Sickness Commission of the Royal Society*, No. 12, p. 89). The jagged hole is attributed to an enemy which devours the contents of the pupa from outside.]

A. G. B.

YELLOW FEVER.

JOHNSTONE (R. W.). **Report to the Local Government Board on the Progress and Diffusion of I. Plague. II. Cholera. III. Yellow Fever throughout the world during the Year 1913.**—*Rep. to Local Govt. Brd. on Pub. Health & Med. Subjects.* vi.+110 pp. 1915. London: Printed under the Authority of H. M. Stationery Office.

As the title indicates the paper is a review of the outbreaks of yellow fever recorded during the year 1913. A short account is given of the investigations of SEIDELIN, MACFIE and JOHNSTON in West Africa on the presence of *Paraplasma flavigenum* in yellow fever cases and in other apparently healthy individuals which are supposed to be carriers of the disease. Their claim to have infected guinea-pigs and rats with these bodies is also mentioned, though no reference is made to the finding of apparently identical bodies in healthy guinea-pigs in England by several observers.

In West Africa in 1913 yellow fever was recorded from Nigeria (29 cases in Lagos), Togoland, the Gold Coast Colony, Portuguese Guinea, Senegal and French Congo; in South and Central America the disease was noted in many places: in Brazil, at Manaos (39 deaths), Para (4 deaths), Ceara (8 cases), Pernambuco (3 deaths), Bahia (78 cases, 54 deaths), and Rio de Janeiro (3 imported cases). In Venezuela nine cases were recorded from Caracas, and in Colombia one case from Carthagena. In Peru a few cases were recorded at Iquitos early in the year. During the year the disease continued to be epidemic in a number of towns of Ecuador, such as Guayaquil (221 cases, 123 deaths), Milagro (66 cases, 34 deaths), Naranjito (38 cases, 24 deaths), Duran (18 cases, 9 deaths), Agua Piedra (10 cases, 6 deaths), Bucay (9 cases, 5 deaths), Babahoyo (2 cases, 2 deaths), Yaguachi (1 case), making a total of 365 cases and 203 deaths. Yellow fever was reported from a number of places in Mexico, including Campeachy, where there were 34 cases and 17 deaths. In the West Indies cases occurred at Havana on board the steamship "Hydra" coming from Manaos and steamship "Morro Castle" from Campeachy. No extension of the disease occurred on shore. Application of modern measures has caused the entire disappearance of the disease in Cuba, a former hotbed of infection. In Trinidad a localised outbreak occurred at Brighton, some 40 miles distant from Port of Spain. The origin of this epidemic of 10 cases is obscure.

On British ships no case of the disease was recorded as being on board at time of arrival at British ports, but several cases occurred at the port of departure or at the beginning of the voyage for England. Three cases occurred on two Liverpool-bound vessels, one of which came from the Amazon and the other from West Africa.

C. M. Wenyon.

YELLOW FEVER COMMISSION (WEST AFRICA). **Third Report.** ii+51 pp. 1915. London: J. & A. Churchill. [Price 1*s.* 6*d.* net.]

The first two Reports of the Commission were summarised in this *Bulletin*, Vol. 5, No. 2, 1915. Since they were issued Dr. Andrew BALFOUR, C.M.G., has been appointed by the Secretary of State to be a member of the Commission.

No case of yellow fever has been reported from the West Afrcian colonies since February 15th, 1914.

The present report deals with the questions of the occurrence and significance of the bodies with which the name of Dr. Harald SEIDELIN is associated, and his case in favour of the "*Paraplasma flavigenum*" as the organism of the disease is stated in his own words as far as this has been consistent with the necessary limits of the Report. With Dr. SEIDELIN'S claims those interested in the disease are already familiar.

Before considering in detail the various questions which arise in connection with "*Paraplasma flavigenum*," a succinct statement is set out of the facts at present known concerning the virus of yellow fever, together with Dr. SEIDELIN'S views upon them, and their relationship to his bodies.

"(1) It is certainly transmitted by the *Stegomyia fasciata*. It is not known to be transmitted under normal conditions in any other way.

"Dr. Seidelin is of opinion that 'the axiom that Yellow Fever is transmitted by no other mosquito than the *Stegomyia fasciata*' is 'an assertion entirely without proof,' and also that 'Yellow Fever is transmitted in nature by no other means than mosquitoes has never been proved, but is extremely probable in view of our knowledge of protozoal diseases.'

"It might have been added 'and in view of our knowledge of the effects upon the incidence of the disease afforded by the destruction of the *Stegomyia fasciata*.'

"(2) The transmission can only take place after the Yellow Fever parasite has undergone a development in the mosquito, the duration of which is, approximately, twelve days.

"Dr. Seidelin considers that 'this theory is likely to be correct, but has not been conclusively proved.'

"(3) The virus will pass through a Berkefeld filter and belongs to the class to which the term ultra-microscopic is usually applied.

"It has been objected that the parasite as described by Dr. Seidelin cannot be supposed to be able to pass through a Berkefeld filter.

"Dr. Seidelin meets this objection by the suggestion that there may be an earlier stage in the evolution of the parasite in which it is invisible and able to pass through the filter.

"(4) The blood of the Yellow Fever patient is infectious only during the early period of the disease, probably not after the third day.

"Dr. Seidelin does not accept the view of 'the three days' infectiousness'; he believes that 'a dogma in medicine has never been established on poorer evidence.'

"It is not possible within the necessary limits of this report to consider the evidence upon which this view has obtained general acceptance. Those interested in the question who still entertain doubts are referred to the original reports of the American Yellow Fever Commission."

The Report then proceeds to discuss the evidence in favour of the acceptance of "*Paraplasma flavigenum*" as the causal agent of yellow fever and to point out that its acceptance involves the admission of the following propositions:—

"(*a*) They are found in the blood of patients suffering from Yellow Fever.

"(*b*) They are not found in human blood under other conditions.

"(*c*) They are found in the blood and tissues of animals (guinea-pigs, white rats, dogs and monkeys) inoculated with blood from Yellow Fever patients.

"(*d*) These animals are suffering from Yellow Fever.

"(*e*) From such animals by sub-inoculation the disease (Yellow Fever) may be transmitted to successive generations and in the blood the specific bodies are found.

"(*f*) If the bodies are found in the blood or tissues of animals which have not been thus dealt with, such animals are the subjects of a natural infection."

These propositions are then discussed in detail.

In dealing with proposition (*a*) the Commission finds that sufficient proof has been adduced that these bodies have been found in the blood of a very large number of cases of yellow fever.

"It is, however, hardly necessary to point out that this is only one link in the chain of evidence upon the integrity of which the claim is founded.

"If it can be shown that similar bodies are of frequent occurrence in the blood or tissues of man or animals apart from any suspicion of Yellow Fever, it is obvious that the whole contention falls to the ground, and that there is no necessity for any further discussion as to their specific nature."

As to the question of their absence from human blood in other conditions (proposition (*b*)), the Report, after first stating the control observations of Dr. SEIDELIN and other observers, refers to the cases "in which Dr. Seidelin himself admits that the diagnosis of yellow fever was at least sufficiently doubtful to require careful examination, or to need the construction of a theory to account for the presence of *Paraplasma flavigenum* under the circumstances in which it was found."

The following remarks are made in connection with the presence of the bodies in the blood and tissues of animals inoculated with blood from yellow fever cases (propositions (*c*) and (*d*)).

"The evidence here given is, we think, sufficient to justify the conclusion that these bodies may be found in the blood of guinea-pigs and other animals which have been inoculated with blood from Yellow Fever patients.

"But here, again, the same caution is necessary in accepting the evidence as proof of the specific nature of the parasites, as, if they can be shown to be present in the blood of guinea-pigs and other animals which have not been thus treated, the whole argument fails.

"The suggestion that non-inoculated animals in which the parasites are found must be reservoirs of Yellow Fever is ingenious, but not convincing; the more scientific method would be to institute an extensive research in animals of the same species which have never been in a Yellow Fever country."

In dealing with the question of the absence of the bodies from the blood and tissues of animals not inoculated with blood from yellow fever patients, the Commission requested Dr. David THOMSON to examine the blood of guinea-pigs in London for the presence of Seidelin bodies. Twenty-five animals were examined. In all except four, bodies resembling SEIDELIN'S yellow fever parasites were found. Dr. THOMSON came to the conclusion that:—

"With regard to the nature and origin of these bodies no dogmatic statement is possible, but that it is highly probable they arise from various sources. Without doubt the great majority of them are artefacts, and cannot be considered as protozoal in nature, though some of those consisting of a reddish ring with a darker staining centre may possibly be an early stage in the *Lymphocytozoon cobayae* (Kurloff bodies), which were found in practically all of the guinea-pigs examined."

As regards propositions (*e*) and (*f*) the evidence that is relied on to prove these statements is that:—

"(*a*) A certain type of pyrexia is observed in the inoculated animal,

"(*b*) albuminuria occurs,

"(*c*) the *Paraplasma flavigenum* is found in the peripheral blood during life,

"(*d*) the same organism is found in the blood and tissues after death,

"(*e*) certain lesions are found in the gastro-intestinal tract and in the kidneys, similar to those observed after death from Yellow Fever."

The Commission is of opinion that the evidence on these points, which cannot be reviewed here in any detail, fails.

The conclusions arrived at by Dr. C. M. WENYON and Dr. G. C. LOW as a result of their investigations here on the occurrence of *Paraplasma flavigenum* in the blood of normal guinea-pigs [see this *Bulletin*, Vol. 5, p. 79] are embodied in the Report.

The Report ends with the following list of conclusions at which the Commission has arrived :—

"1. That no proof has been given that the bodies named *Paraplasma flavigenum* are of protozoal nature.

"2. That under that name a number of microscopic objects are included.

"3. That, excluding artefacts, the origin of most of these objects is at present uncertain, and so far none have been proved to possess any definite physiological or pathological importance.

"4. That there is so far no reason to regard any of these objects as the cause of Yellow Fever.

"5. That the nature of the virus of Yellow Fever still remains undetermined."

E. J. Wyler.

YELLOW FEVER COMMISSION (WEST AFRICA). **Reports on Questions connected with the Investigation of Non-Malarial Fevers in West Africa.** *Yellow Fever Bureau Bulletin.* Yellow Fever Commission.—Investigators' Reports. Supplement. Volumes I & II.—752 pp. With maps & illustrations. 1915. Liverpool: The University Press of Liverpool. [Price 25*s.* net. (For Subscribers to the *Bulletin* 21*s.* net)].

These two volumes, containing between them 752 pages, are the reports of the investigators employed in West Africa by the Yellow Fever Commission. They are published by the Committee "as a basis for criticism and discussion." They deal with non-malarial and, incidentally, with malarial fevers studied in Nigeria, Sierra Leone and the Gold Coast and with experimental work done in these countries and in England. One of the investigators visited Guayaquil and reports on the cases of yellow fever seen by him there [see this *Bulletin*, Vol. 5, p. 76]. In the review of these volumes it is proposed to give some account of the epidemiological and clinical observations made in each of the three colonies, and then a brief synopsis of the experimental work. No opportunity for the study of yellow fever seems to have occurred except in Nigeria.

Sierra Leone.—Four of the reports concern Sierra Leone, by Major STATHAM, R.A.M.C., Dr. G. C. BUTLER, and Drs. J. M. DALZIEL and W. B. JOHNSON. The work of the first two investigators was carried out independently but contemporaneously at Freetown from May to September 1913, at which date Dalziel and Johnson commenced observations at the same place. There are consequently three sets of tables of the fevers met with at Freetown which are to some extent comparable. Statham reports on 1,100 cases of fever, nearly three-fourths from military hospitals, including 483 West Indians, 270 Europeans, 312 West Africans and 21 Syrians; 131 were children.

All but 150 were hospital in-patients and could be kept under observation; furthermore the soldiers came under observation at the outset. Butler had 342 cases, 298 of which were seen either as in- or out-patients at the Colonial Hospital; 270 were West African natives. Dalziel and Johnson's cases were apparently from the same source; they numbered 461; 419 were West Africans.

The accompanying table is compiled from three in the text, several conditions recorded once only being excluded. The minimum to constitute a fever case was, in Statham and Butler's statistics, a temperature of 100° F. and at least one day of fever.

Table of Statistics.

Disease.	Statham (adults only).	Butler.	Dalziel and Johnson.	
Malaria	676	201	221	All proved microscopically.
Probable malaria ..	49	—	37	
Ankylostome fever or Helminthiasis	22	—	15	Statham's were the severer forms leading to admission to hospital.
Bronchitis	20	5	25	
Pyogenic	13	—	—	
Syphilis	13	—	2	
Rheumatism	12	—	5	
Blackwater	6	2	1	
Tubercle or Phthisis ..	5	10	6	
Pneumonia	6	14	13	
Jaundice (Catarrhal) ..	5	—	3	
Trypanosomiasis ..	2	1	6	
Hepatitis	2	—	4	
Typhoid	1	2	2	
Whooping cough ..	—	2	4	
Pleurisy	—	2	9	
Septicaemia	—	2	1	
Dysentery	—	1	2	
Acute rheumatism ..	—	1	1	
Yellow fever	—	—	1	
Coryza	—	—	20	
Enteritis and Pyrexia (?)	25	—	—	Diarrhoea a prominent symptom.
Ankylostomiasis (?) ..	12	—	—	Outpatient Africans whose blood showed a high eosinophile count.
Kala Azar (?)	5	—	—	Outpatients.
Diarrhoea	—	—	4	
Constipation	—	—	9	
Dyspepsia	—	—	6	
Cirrhosis of Liver ..	—	—	2	
Stomatitis	—	—	2	
Adenitis	—	—	5	
Doubtful	85	48	33	Tabulated with details by Statham & Butler.

As regards the laboratory methods employed, Statham and Butler used dry blood films and made a differential leucocyte count, the former

invariably, the latter when malarial parasites were not found. Urine examinations were made by the M. O.'s in charge; nitric acid and heat were used. The stools were examined in many cases.

In Statham's 676 cases of malaria, forming 83 per cent. of fevers in adults, all but 10 were sub-tertian, though quartans and tertians formed 20 per cent. of the parasites found in 100 sick children. He does not think that pappataci fever or epidemic dengue occur in Sierra Leone. He believes that some of his "rheumatism" cases may have been ankylostome fever. He notes that the "doubtful" cases decreased in number as the blood examinations became more frequent and prolonged.

Butler points out that his malarial cases form 60 per cent. of the whole; his subtertian cases formed 95 per cent. of the total, quartan being 4·5 per cent. and benign tertian 0·5 per cent. He divides his "doubtful" cases into pyrexia of short duration, and pyrexia of more than seven days' duration.

In Dalziel and Johnson's cases a diagnosis of malaria was made in 48 per cent. on the strength of finding "the parasites present in sufficient numbers to justify that diagnosis." In 28 cases, including 12 of malaria, there was jaundice. The two typhoids were natives.

With regard to the Problems for Investigators, which were set out in detail in this *Bulletin*, Vol. 5, pp. 71–2, Statham considers that typhoid is more prevalent than is at present supposed and that leishmaniasis is also present, if rare. He thinks that malaria can produce bilious remittent fever and malignant bilious remittent fever and that these types are more likely to occur in persons with incompetent livers.

Albuminuria.—Statham and Butler discuss the significance of albuminuria in natives. In Statham's cases albumin was present in 9 of 75 cases among Europeans and in 32 of 75 natives. He attributes this largely to urethral affections, and possibly to ankylostomiasis. Casts were rarely or never found. Butler examined 437 urines at the Colonial Hospital; 189, or 43 per cent., showed albumin in quantities from a trace upwards, and 60, or 13 per cent., in some quantity; he remarks that a prostatitis or gleet is almost the rule in natives above a certain age.

Febrile Diseases of Children.—Statham tabulates the diseases in children separately owing to the fact that "some two-thirds of them always harbour malarial parasites in their blood." In 33 of the 131 malaria was the only obvious cause, and in 60 bronchitis, whooping cough or other cause was associated with the malaria. Butler examined 100 supposed healthy children between 3 and 10 who were at school; 49 showed parasites (41 subtertian and 8 quartan). Dalziel and Johnson found malaria in about 85 per cent. of febrile illnesses in 93 children.

Infant mortality. Statham cannot throw light on the high infantile mortality. He does not think it attributable to syphilis. "To what extent the universal infection of native children with malaria affects the mortality rate it is impossible to say." Butler thinks that syphilis "very largely affects the rate of infantile mortality in Freetown." He obtained an account of their pregnancies from 263 women; 804 pregnancies were accounted for, and these included 111, or 13·8 per cent. still-births or miscarriages. He thinks that acquired syphilis is very common; congenital syphilis is rarely seen.

Dalziel and Johnson had one case of yellow fever, in a European stationed 60 miles from Freetown. They note the comparative freedom of Freetown from mosquitoes; those seen are usually Stegomyia or Culiciomyia.

Dalziel and Johnson also contribute notes on a visit to Sherboro District in search of cases of fever suitable for study. This is situated on the coast of Sierra Leone and consists of two lowlying islands and a peninsula. It was in the dry season and no Stegomyia were found. Few cases of illness were seen.

Gold Coast.—Three Reports deal with the Gold Coast, those of Drs. H. S. Coghill and H. M. Hänschell, and H. M. Hänschell alone, with work done at Sekondi and in the Northern Territories, and that of Dr. G. E. H. Le Fanu with work done at Quittah. Le Fanu's contribution is a detailed table and an appendix in which special cases are described. The table records 43 cases of fever, 29 of which were in children under ten; in 38 malarial parasites were found. One case—in which death occurred—was diagnosed as ankylostomiasis and another as yellow fever. This case is reported in detail on pp. 589–93.

Coghill and Hänschell's work at Sekondi lasted from April 1913 to, in the case of Hänschell, April 1914. No case of yellow fever was observed; one supposed case turned out to be streptococcal septicaemia. They examined 373 patients—87 Europeans and 286 natives. Blood examinations were made of these and also of 233 healthy persons, or 606 in all; 72 were children. Malarial parasites were found in 259, or 42 per cent.; nine of these persons had also albuminuria and jaundice. Benign tertian parasites were found in 60 cases, quartan in 84, and subtertian in 189, many persons harbouring more than one variety. A list of diseases observed in Europeans and natives respectively is given; malaria is far ahead in each case. Details are appended of the cases with albuminuria.

Hänschell discusses questions bearing on the endemicity of yellow fever. A year's observation showed him that mosquitoes were very rare in Sekondi. Notes are given of the flora and fauna of *S. fasciata.* Blood films from men and various animals were searched for *Paraplasma flavigenum*; bodies resembling this were often found but "all lacked definition and constancy of outline and staining property." Four hundred and sixty-four blood films were examined in the second half year and differential counts made. The average large mononuclear leucocyte count, for cases in which no malarial parasites could be found in a thick film, was between 9 and 11 per cent. When it was 13 per cent. and over malarial parasites could be demonstrated. The blood of 53 school children in Sekondi was examined; malarial parasites were found in 29, or 54 per cent. The author notes that anopheles are extremely rare in Sekondi to-day and surmises that these infections were contracted one or more years ago. The splenic index is not given.

In the course of the enquiry at Sekondi two cases of yellow fever were reported at Bole in the Northern Territories and Dr. Coghill went to investigate. Previous suspicious cases had occurred in two native policemen who had attended the dispensary, but no notes could be found. According to the natives there had been an epidemic of

some sort in 1910 with symptoms suggestive of yellow fever. An attempt is made to trace the course of this disease, which was supposed to have originated in the Moshi country, Senegal.

Nigeria.—The first 206 pages of Vol. 1 are occupied by "Four Reports on Yellow Fever in Nigeria during 1913" by Dr. E. J. WYLER. The cases reported on occurred at Abeokuta, Lagos, in the Central Province, and on board ship. Maps, plans and temperature charts are supplied and all details are set down. In Report No. 1 the patient, a European trader, had not slept outside his house at Abeokuta for three months. He died in Lagos Hospital on May 14th having come from Abeokuta (64 miles distant), at which place it is shewn that he must have acquired his infection, on May 10th, 1913. It is stated in another part of the volume that this was the first authentic case of yellow fever in Nigeria. The author analysed the cases of malaria occurring at Lagos during 1912 and in 1913 up to the date of the patient's death. Of 127 cases 21 had albuminuria, and in ten of these (six being seamen) the albuminuria could not be accounted for by the temperature or other causes. A table of these is given. In two only was there record of a blood examination. It is suggested that they were really mild yellow fever. The notes of one are appended. It is stated that the conditions throughout Abeokuta are very favourable to the breeding of *S. fasciata*. Water is stored on the native compounds in large earthenware vessels, each compound containing many. Of forty compounds examined larvae of Stegomyia were found in all. The sanitary conditions in Abeokuta, a town of over 50,000 inhabitants, are described as deplorable. It is pointed out that the disease might have been introduced from Lagos via the railway or from Dahomey, with which country there is free communication by many routes.

Points to which attention is drawn in the conclusions are that this was an isolated case of yellow fever in a large native town, that the infecting insect must have received the virus from a native, that the salient feature of the disease in a native is probably unexplained albuminuria and that the reason why epidemics usually start at the coast towns is that the (non-immune) Europeans are mostly congregated there. Details of this patient's case are to be found on page 216 of the volume.

In Report No. 2 there is nothing that calls for notice.

Report No. 3 concerns a Syrian case and three native cases at Abeokuta, two of the latter having been treated as outpatients. The clinical history is given in each instance; there are few details in the case of the natives.

Report No. 4 is a long one, dealing with fever at Warri, Forcados and Burutu, and thirty-three cases on ocean-going vessels and dredgers in 1913 and 1914. Incidentally there is a discussion whether a urethral discharge interferes with the tests for renal albuminuria. Albuminuria being regarded of great significance in the diagnosis of mild cases of yellow fever, and gonorrhoea being prevalent among the natives, this question becomes of importance. The author had the opportunity of testing the urine in seven cases of uncomplicated gonorrhoea, and found that a very faint cloud appeared on boiling, after one hour's or more standing.

Four native cases discussed here occurred in the Forcados gaol and three of the patients had been inmates for five, six and eight months

respectively. These are difficult to explain as the sanitary conditions are described as efficient and the author puts forward the suggestion that the yellow fever organism, having gained access to a man, may remain latent in him till "stimulated into activity by some debilitating influence acting on the host." The whole report is full of detail and cannot be summarised.

A Report on certain outbreaks of yellow fever in Lagos, 1913, and January and February, 1914, is given by Dr. T. M. Russell Leonard. There were in all 38 cases, ten of which died and the rest recovered; 15 were Europeans and 13 of these sea-faring men. Of twenty negroes all recovered. A very complete account of these cases is given, followed by a synopsis of the symptoms and by appendices. In Appendix A is discussed the diagnosis between yellow fever, bilious remittent and pappataci fevers, and questions of immunity. It is considered that Faget's sign, albumin in the urine and epigastralgia distinguish yellow fever from bilious remittent fever, but both may occur together. In Appendix B a disease is discussed known to the natives as "uto enyen" or yellow eyes, and in Appendix C statistics showing the presence of the malarial parasite in cases of malaria and other fevers in Lagos. It was found in 13 cases of yellow fever. Three cases of pappataci fever are recorded.

The appendix to Dr. O'Brien's account of his visit to Guayaquil contains details of several cases, which may be compared with the details of the Nigeria cases.

Experimental Work.—Experimental work was carried out at Accra in the Gold Coast, and Lagos in Nigeria by Drs. H. Seidelin, A. Connal and J. E. L. Johnston, and in England by Dr. D. Thomson and Major D. S. Harvey. Blood slides were also examined by Dr. C. M. Wenyon.

Seidelin and Connal writing on Experimental Yellow Fever in Laboratory Animals conclude that "the yellow fever parasite, *Paraplasma flavigenum*, has been transmitted to guinea-pigs and monkeys by direct inoculation of blood; that the infection has been carried seriatim through 23 guinea-pigs; that the peripheral blood of the infected animals contains forms of the parasites identical with those occurring in human blood in yellow fever; and that various internal organs of the infected animals, particularly the lungs, contain elements regarded as division forms of *P. flavigenum*." The forms regarded as parasitic are illustrated in a coloured plate. Seidelin's paper is followed by D. Thomson's Report on the Examination of the Blood of Twenty-Five Normal Guinea-pigs for the Presence of Seidelin Bodies. From the guinea-pigs, obtained in England, bodies resembling these were found in all but four. After examining marked blood-films sent home by Seidelin Thomson writes:—"Nearly all of the bodies shown in his specimens are more indefinite than I had imagined they would be, and in fact, in my examination of normal guinea-pigs' blood, I have seen several such bodies, but have passed them over as artefacts and too indefinite to paint."

Thomson indicates their probable sources. There is a coloured plate of the stained objects which may be compared with Seidelin's. In a further Report from Seidelin on the subject of his earlier one he describes observations on guinea-pigs which were inoculated on board ship from the former series and brought home to Liverpool; some were sent to Sir W. Leishman.

The next paper, a Report on some Histological Lesions observed in Laboratory Animals infected with Yellow Fever, is by the same author. It is illustrated by beautiful coloured plates.

Connal and Johnston write of Natural Infections in Guinea-pigs, of which 153 were observed; 36 pages of temperature charts are given. No very definite conclusions were reached.

Lastly, Major D. S. Harvey reported on the Examination of Normal and Inoculated Guinea-pigs. He gives figures from stained blood films of 25 normal English guinea-pigs, of inoculated guinea-pigs, of guinea-pigs inoculated with blood of normal guinea-pigs, and of West African "infected" guinea-pigs.

[After a perusal of these reports one has a vivid sense of the difficulties of the problems which the investigators were called upon to solve. When should and when should not the presence of malarial parasites be held to justify a diagnosis of malaria? The investigators seem to differ in their views. What is the significance of albuminuria in West African fevers? Possibly a careful study of the urine in fevers in another part of Tropical Africa free from yellow fever, say the East Coast, would be instructive. We seem to know very little, about the causes of infantile mortality of native races in West Africa, and yet the subject has great importance. It is clear that in West Africa the association of albuminuria, jaundice, and a raised temperature need not mean yellow fever. What seems to be wanted above everything is a clinical test for the disease.]

A. G. B.

d'Anfreville (L.). **La fièvre jaune et le Maroc.**—*Bull. Soc. Path. Exot.* 1915. Dec. Vol. 8. No. 10. pp. 732–733.

This is a short paper dealing with the possibility of introduction of yellow fever into Morocco. The author points out that he has found *Stegomyia fasciata* in many coast districts, and estimates that it exists in the proportion of 25 to 50 per cent. of all mosquitoes captured by him. The author ascribes the freedom of Morocco from yellow fever to an absence of ports where ships can come nearer to the shore than a mile. He points out that the completion of the ports of Casablanca, Mazagan, and Rabat will permit vessels to come alongside the quays and that then infection may be introduced, notably from Senegal (French West Africa)—a three or four days' voyage.

E. J. W.

Commonwealth of Australia. Quarantine Service Publication No. 6. 95 pp. Illustrated. 1915. Melbourne: Government Printer.—**Australia and Yellow Fever.**

This is a compilation of the important facts (together with an estimate of their significance) bearing upon the question of the introduction of yellow fever into Australia as a result of the opening of the Panama Canal.

The publication is divided into four sections which, with their respective authors, are as follows:—

1. The Danger of the Introduction of Yellow Fever into Australia. By J. H. L. Cumpston, Director of Quarantine.

2. Clinical Diagnosis of Yellow Fever. By A. Breinl, Director of the Australian Institute of Tropical Medicine.

3. Report of Survey of the Distribution of *Stegomyia fasciata* in the Ports of Queensland. By F. H. TAYLOR, Entomologist to the Australian Institute of Tropical Medicine.

4. The Recorded Occurrence of *Stegomyia fasciata* in Australia and New Guinea. By F. H. TAYLOR.

1. This part of the subject is very fully dealt with and occupies nearly half the publication. The author quotes various authorities who have drawn attention from time to time to the possibility of Australia becoming infected by yellow fever and to the increase of this risk consequent upon the opening of the Panama Canal. An account is then given of the geographical distribution of the disease. A map of the world on Mercator's projection is included, showing those countries differentially coloured in which yellow fever has occurred, and in which it is endemic [but see footnote].* The places adjacent to Australia in which *Stegomyia fasciata* has been found are also specially coloured.

The combative measures which have been adopted in the infected countries are discussed. It is concluded from the information "concerning those countries where yellow fever exists . . . that it would be fatal to assume that in any of those countries such precautions are taken continuously and consistently as would effectually prevent the infection of ships lying within the ports. In some of the countries some such precautions are taken, but in considering the danger to Australia, any assumption that such precautions are in themselves sufficient guarantee of protection to Australia would be unjustifiable." The question of the possible transmission of infected mosquitoes from a yellow fever country to Australia is then considered, the conclusion being that such transmission "is not only a possibility but constitutes a distinct danger." Investigations in Queensland concerning the distribution of *Stegomyia fasciata* show that it is present in the principal coast towns and that it is "sufficiently prevalent . . . to permit of the rapid spread of yellow fever if it were introduced."

There next comes under review the question of the distribution of *Stegomyia fasciata* in the surrounding countries from which the disease might be "relay"-ed into Australia.

The conclusion to this section is as follows :—

"The greatest danger at present is from the endemic foci on the Pacific coast of America. The opening of the Panama Canal will bring other foci

*In the U.S. Public Health Reports, December 5th 1913, p. 2637, a table of the occurrence of yellow fever in 1913 appeared (Foreign Reports), in which under heading British East Africa two cases of that disease were attributed to Kisumu, 25 to Mombasa, and one to Nairobi. This table reappeared on December 12th, p. 2707, on December 19th, p. 2785, and on December 26th, p. 2858. In the number for January 9th, 1914, p. 88, the following footnote was published :—Report of plague in British East Africa erroneously entered as yellow fever on page 2858, Vol. 28—and the foot-note was repeated on page 1718 of the same volume. Meantime however the original entry had been copied into Public Health Bulletin (U.S. Public Health Service) No. 64, page 17, and indicated on the "quarantine map of the world" and it now reappears in the map which illustrates the publication under review, where British East Africa shares with Central America, the northern half of South America and West Africa, the distinction of being painted red. Doubtless we shall next meet with the statement in text-books ; it is hardly to be hoped that correction will ever catch it up. In point of fact yellow fever has never been reported from British East Africa.—[ED.]

within range of Australia, but the greater distance of these foci from Australia, and the care that will be exercised by the United States authorities over vessels passing through the Canal zone combined also with the local control exercised by the authorities in those countries from which trade to Australia will be most probable, will, to a certain extent, reduce the risk.

"The possibility that yellow fever may be carried to Australia direct from these endemic foci must be recognised, and this danger is sufficiently real to justify all precautionary measures against vessels arriving in Australia from these places. A greater danger, however, exists by reason of the prospect of one of the ports adjacent to Australia becoming infected and acting as a relay station for Australia.

"The prevalence in large numbers of *Stegomyia* in the northern ports of the eastern coast of Australia permits of the rapid spread of the disease if introduced, and one of the serious aspects of the question is that epidemics of yellow fever frequently commence with a series of mild cases, the nature of which may be overlooked.

"The fact that the trade with Queensland and America has already increased, and shows signs of still further increase, combined with the ascertained fact of the great prevalence of *Stegomyia* in that State, point to the obvious necessity of doing all that can be done to anticipate or prevent any possible outbreak. It is obvious that if the *Stegomyia* population in any port were to be reduced to a vanishing point, as has been done in the Panama Canal zone, nothing need be feared even if cases were actually introduced, but *per contra*, so long as the mosquito population is allowed to remain unchecked, any undetected introduction of the disease is a potential starting point for a serious epidemic.

"The loss of life, and the dislocation of commerce and shipping that would result from the occurrence of an epidemic of yellow fever might easily become a very serious matter, and notwithstanding the utmost care given by the Quarantine Service, an infected mosquito might escape and be sufficient to commence such an epidemic.

"In view of all these facts the proposal put forward by James that there should be an Intelligence Officer, trained in sanitary administration, stationed at Panama to act as an outpost for Australia and Asia is worthy of the warmest support [see this *Bulletin*, Vol. 3, p. 179].

"In addition to this officer it would become advisable that the New Zealand and Commonwealth authorities should combine and station an officer in Samoa or Tahiti, should it appear as time goes on that vessels coming to Australia or New Zealand, from America are making these places regular ports of call.

"The most important aspect of the yellow fever question, so far as Australia is concerned, is that all steps should be taken to reduce the local mosquito population. Australia is, at the present time, in precisely the condition ironically described by Agramonte in referring to the American States. He says that:

"These depend almost exclusively upon quarantine measures to prevent the introduction of yellow fever. The bugbear of the Southern States of America is yellow fever, and their protective mainstay is quarantine, the least useful measure which may be implanted in any country for its defence against this infection.—

"This is a very undesirable condition of affairs, and no sort of security will be possible until the greatest possible reduction of *Stegomyia* mosquitoes in the coastal districts, and provision of effective means for limiting introduced infection, render the spread of yellow fever impossible."

2. This section consists of a short clinical description of the disease for the benefit of Quarantine officers who may be called upon to make a diagnosis. The following statement is of importance [the italics are the author's]:—

"Even in the earliest cases, small capillary injection is noted about the teeth in the same position where the lead line appears in lead poisoning. The mucous membrane of the cheek is injected, and on the floor of the mouth, around the attachment of the tongue, minute red spots are seen.

This condition of the mouth is hardly ever seen in any other fever and is rarely absent in cases of yellow fever, and can, therefore, be regarded as pathognomonic."

3. This section contains the results of the survey of the chief coastal towns of Queensland, made in 1914, with the object of determining the distribution of the *Stegomyia fasciata* mosquito and show it to be abundant on this coast. A number of photographs illustrate the author's investigations.

4. No organised mosquito survey of Australia and New Guinea has yet been attempted, so that, in this short section, which consists of a record of disconnected observations, the information conveyed is necessarily incomplete.

E. J. W.

CARTER (Henry R.). **Immunity in Yellow Fever.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. July. Vol. 8. No. 8. pp. 279–282.

The author produces some evidence in favour of permanent immunity from yellow fever after one attack. The Plant steamship line brought passengers from Havana to Florida, Key West and Tampa, a journey of 7 and 24 hours respectively. There was no bar to any passengers "immune to yellow fever by previous attack or ten years' residence in an endemic focus." Taking only the 28 quarantine weeks April 15th to November 1st, during nine years at least 6,300 people came in this way, and they came in hot weather to towns in which Stegomyia were abundant and where people susceptible to yellow fever were abundant also. If then a considerable proportion of them were infective to Stegomyia, their advent should have resulted in outbreaks of yellow fever. This was not the result, so one must conclude that no considerable number were capable of infecting Stegomyia. During this period approximately 225 people, who had not had yellow fever, from Havana gave twelve cases of yellow fever, every one of which would have been infective to Stegomyia. These 225 people if admitted to Florida would undoubtedly have introduced the disease, whereas the 6,300 which were admitted on account of their immunity did not introduce it. As the author remarks, the evidence is a negative one, but negative evidence is convincing in proportion to its mass.

C. M. W.

HERNÁNDEZ FAJARDO (Diego). **Formas benignas de la fiebre amarilla. Su importancia.** [The Importance of Mild Forms of Yellow Fever.]—*Rev. Med. de Yucatan.* 1914. June. Vol. 9. No. 8. pp. 169–173.

A short paper pointing out that yellow fever may exist for a series of years in a locality in a such mild form that cases of it may be, and commonly are, mistaken for something else. The disease described by GRALL and CLARAC* as occurring in the Antilles and French Guiana under the name of inflammatory fever, is probably, in the author's opinion, a larvate form of yellow fever.

J. B. Nias.

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*GRALL (Ch.) & CLARAC (A.). Traité Pratique de Pathologie Exotique. Vol. 3. 1912. Paris: J. B. Baillière et Fils. Fièvre jaune, by CLARAC and SIMOND, pp. 61–64.

MACFIE (J. W. Scott). **Arneth Counts in Yellow Fever.**—*Jl. Trop. Med. & Hyg.* 1916. Feb. 15. Vol. 19. No. 4. pp. 41–45. With 4 charts.

This paper embodies the results of the examination of the polymorphonuclear leucocytes by the method of ARNETH in 19 definite cases of yellow fever, fourteen of which occurred in Guayaquil, Ecuador, and five in West Africa.

The American cases, at the period of the disease when they came under observation, showed a profound shift to the left of the Arneth count, the index being, as a rule, not less than 90·0.

In the West African cases, two of which were mild, there was also this well-marked deviation to the left.

"In fatal cases, so far as can be judged from the materials examined, the Arneth index either remains very high, or mounts still higher as the disease progresses.

"In cases that recover, on the other hand, the index, after remaining high until about the seventh day, begins to fall rapidly and reaches a figure approximating to the normal about the tenth to the fifteenth day. In this respect yellow fever appears to differ from malaria (*P. falciparum* fever), for in the latter disease, in the few cases that have been examined on a number of successive days, the deflexion of the Arneth count has been observed to persist somewhat longer.

"It is probable that there is nothing actually specific about the changes in yellow fever, and it may perhaps be anticipated that a similar profound shift to the left of the Arneth count will be found to be present in the early stages of other acute conditions accompanied by high fever and profound toxaemia, such, for instance, as plague, etc. In the majority of such diseases, however, even in the early stages, there will be other signs and symptoms to aid the diagnosis; but in yellow fever in the mild attacks, and in the initial stages of the more typical forms of the disease, these are, unfortunately, often absent or of a negative character, and it is in such cases that the Arneth count may be of assistance in determining the nature of the infection."

The author explains the change in the index in yellow fever on the hypothesis that the cells to the right of the count, which he considers are probably the older and less resistant, are destroyed by the toxaemia. In this way the leucopenia of the early stages of the disease is caused, and the shift to the left in the count is produced. He finds support for his hypothesis in O'BRIEN'S observations (1914) of an acute degeneration of the polymorphonuclears in yellow fever. The continuance of the shift to the left after the disappearance of the leucopenia he explains on the assumption of an increased activity of the leucopoietic system, with the production of a correspondingly large number of young polymorphonuclear leucocytes.

E. J. W.

CROPPER (John Westray) & DREW (Aubrey Howard). **The Occurrence of Bodies resembling "Seidelin Bodies"** (*Paraplasma flavigenum ?*) **in Anaemic and Foetal Blood, with some Remarks on their Probable Nature.**—*Jl. Trop. Med. & Hyg.* 1916. Jan. 15. Vol. 19. No. 2. pp. 20–24. With 1 plate.

At the request of the Yellow Fever Commission (West Africa) a search for Seidelin Bodies was made by one of the authors in the blood of anaemic adults and children resident in England. In the blood of 102 persons (70 per cent. of whom suffered from anaemia) he

found only five definite bodies; these occurred in children with a moderate degree of anaemia. Both authors continued the investigation, acting on the suggestion of WENYON and LOW that "a further study of the exact nature of these bodies would be of interest with a view to determining whether they are developmental or degenerative in origin." They state that they have also recently been able to confirm WENYON and LOW's results by finding the bodies in the blood of foetal guinea-pigs.

Their "examination showed the presence of bodies resembling Seidelin bodies, and the relative frequency of their occurrence in blood from different sources, to be as follows. (The cases marked with an asterisk are quoted from the Report to the Yellow Fever Commission already referred to):—

Source of Blood.	Number of Cases.	Number of Cases containing Seidelin Bodies.		
		Positive.	Doubtful.	Negative.
Adults, and children (all ages). Not anaemic ..	26	—	4	22
Adults, and children (all ages). Not anaemic ..	34*	—	—	34
Adults, and children above 5 years of age. Anaemic	12	3	3	6
Adults, and children above 5 years of age. Anaemic	47*	1	5	41
Children under 5 years of age. Anaemic	12	1	1	10
Children under 5 years of age. Anaemic	21*	3	—	18
Pernicious anaemia ..	1	1	—	—
Human foetus	8	8	—	—
New-born kittens	6	6	—	—

"The features brought out by this table are that, while no Seidelin bodies could be found in the blood of sixty persons without obvious anaemia, and only eight definite bodies in ninety-two cases of ordinary anaemia, slight and severe, yet in the case of pernicious anaemia and foetal blood every sample contained them. Since on the average three blood-films were made from each case, the search for Seidelin bodies in ordinarily anaemic human blood involves the scrutiny of every cell in thirty to forty blood-films to find a single specimen. This scantiness, in comparison with the number present in foetal blood, is very striking."

The authors describe in detail the technique used by them and various fallacies that may arise unless the greatest care is exercised. They consider that the bodies are undoubtedly non-parasitic and that their probable mode of formation is by nuclear absorption. For the detailed discussion of their views as to the nature of the bodies the original paper must be consulted. Suffice it here to say that the blue staining matter in the bodies is regarded as the remnants of the degenerating nucleus. The red staining granules of the bodies are held to be centrosomic in nature, this opinion being based upon the work of E. H. ROSS in 1911, and upon the authors' own confirmation of his experiments.

Their conclusions are as follows :—

"(1) The blood in pernicious anaemia and that of the human foetus and of new-born kittens contains bodies which appear identical with Seidelin bodies (*Paraplasma flavigenum*, the so-called parasite of yellow fever).

"(2) The bodies are apparently absent in the blood of normal and ordinarily anaemic adults. They may rarely be found in the blood of anaemic children.

"(3) The bodies are the remnants of the nuclear degeneration (Schilling-Torgau) which takes place in the conversion of the erythroblast into the normal non-nucleated red corpuscle.

"(4) The red-staining granules are readily demonstrated by the jelly method of *in vitro* staining and are probably centrosomes."

E. J. W.

SEIDELIN (Harald). **The Histology of the Liver in Yellow Fever.**—*Yellow Fever Bureau Bull.* 1915. Aug. 30. Vol. 3. No. 4. pp. 269–296. With 2 plates.

In this paper the author describes in detail the histological changes in the liver in yellow fever. Two coloured plates of colour micro-photographs illustrate the lesions he has found. Without going into details the author's conclusions may be mentioned, which are these. So far no pathognomonic characters have been proved to exist in yellow fever liver, but at the same time a careful histological examination of the organ may be a factor of very great importance in diagnosis. In early cases hyperaemia may obscure the fatty changes and in such cases the demonstration in sudan-stained sections of considerable quantities of fat is a very strong argument in favour of yellow fever, as in early stages of other infectious diseases the liver shows more cloudy swelling than fatty change. In more advanced cases, where the fatty change is manifest to the naked eye, disorganization of the tissue, diffuse but somewhat irregularly distributed necrosis, mid-zonal necrosis, apparent increase of stellate cells and accumulation of fat-containing pigment are the characters to be looked for. All these phenomena may be observed in sections prepared by the freezing microtome, a detail of no small importance where rapid diagnosis is required. Those who are interested in the subject will have to consult the original for greater detail.

C. M. W.

CONVERSE (G. M.). **The Control of Yellow Fever in an Immune Community without the Use of Fumigation.** *Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Vol. 3. No. 5. pp. 289–297.

The paper describes a campaign against yellow fever in the Peruvian town of Iquitos, which is on the Amazon river 2,300 miles from the Atlantic Ocean and 4 degrees from the Equator. The author describes the difficulties he had to overcome, due to the ignorance of the population and the poorness and expense of labour owing to a universal hook-worm infection. Lack of funds prevented any very elaborate or extensive scheme, so that the campaign was limited to what is described as a general "clean up." The town was one of 13,000 inhabitants who lived in 3,059 houses, located in some 160 square blocks and containing 968 wells, 569 water tanks, 3,000 water barrels, 733 latrines, 8,119 water jars, 200 canoes or launches on shore or at

the wharves, some 14 kilometres of roof gutters for the collection of rain water, and such other water containers as were formed by accumulations, lasting through many years, of empty tins, bottles, etc., in every house, garden and vacant lot in the community. Other than a general clean up not a single thing was done except those measures directed exclusively against the larva of *Aedes calopus* and not a single change in sewage, water supply or condition of the streets. In the course of a few months the mortality dropped from 49·52 to 28·88 per thousand and a further intensive campaign against the hook-worm has brought about a further reduction to 21 per thousand.

Iquitos is a town in which yellow fever has been present year in year out since its foundation thirty years ago and the frequency of yellow fever is shown by the 1912 figures of 273 deaths of persons between 15 and 30 years of age, of whom 119 were certified as having died of yellow fever.

C. M. W.

SERGENT (Ed.). **Hypothèse émise en 1821 sur la nature infectieuse de la Fièvre jaune et sur sa transmission par des Insectes.**—*Bull. Soc. Path. Exot.* 1915. July. Vol. 8. No. 7. pp. 467–469.

In 1821 the French Government sent three investigators, BALLY, FRANÇOIS and PARISET to inquire into an epidemic of yellow fever in Catalonia, especially at Barcelona. The results were published in a large volume which appeared in 1823.* The interesting point brought forward by the author is that the writers of the book advised fumigation of the vessels, not so much with a view to purifying the air but to dislodge the numerous vermin which hid in inaccessible places on board and which they considered responsible for the spread of yellow fever.

C. M. W.

*BALLY, FRANÇOIS & PARISET. Histoire médicale de la fièvre jaune observée en Espagne et particulièrement en Catalogne, dans l'année 1821.—664 pp. With 2 charts. 1823. Imprimerie royale.

PELLAGRA.

SILER (J. F.), GARRISON (P. E.) & MACNEAL (W. J.). **Prognosis in Pellagra. A Preliminary Note.**—*Proc. New York Path. Soc.* 1915. Mar. N. Ser. Vol. 15. No. 3. pp. 30–34.

A preliminary report relating to the prognosis in pellagra with regard to the death-rate in the first year of the disease, the liability of the survivors to a recurrent attack in after years, and the death-rate in recurrent attacks. The influence on the prognosis, of race, sex and age is also indicated.

From a study of 1,162 cases of the disease, it appears that the death-rate in the year of the initial attack is about 14 to 15 per cent. Records taken from the initial attack in the case of 697 patients show 1,037 instances of recurrence in after years, and 591 instances of freedom from recurrence, "indicating roughly that those who survive one attack of pellagra have about one chance in three of escaping an attack of the disease in the following year." Taking the patients who showed no signs of recurrence for at least two years after their initial attack as "recoveries," the rate obtained for recovery after one attack was 12·8 per cent. The gross death-rate in the year of recurrent attack is not very different from that of the initial attack and amounts to about 12·5 per cent. of the cases The negro race shows a much higher death-rate from the disease than does the white race; on the other hand the negro is much less liable to be attacked by the disease. The death-rate from pellagra is somewhat higher in males than in females but chronic recurrent attacks are more frequent in females. Generally speaking the percentage of deaths increases with age, the prognosis in children being relatively good.

[The observations were made from cases occurring in Spartanburg County, South Carolina.]

H. Maclean.

NESBITT (Charles T.). **Sanitation and the Control of Pellagra.**—*Jl. Amer. Med. Assoc.* 1916. Feb. 26. Vol. 66. No. 9. pp. 647–648.

Statistical observations are given to show "that the incidence of pellagra is not decreased by improved sanitation and general disease prevention methods and that it is materially increased by business depression and increased prices of food."

These observations refer to the city of Wilmington, N.C., where as the result of general hygienic improvements the death-rate from general causes has steadily decreased, while that from pellagra has advanced.

The following figures illustrate this :—

Year.	Comparison of General Death Rates. Per 1,000.	Comparison of Death Rates from Pellagra. Per 100,000.
1911 ..	29·43	38·83
1912 ..	21·46	21·38
1913 ..	19	16·69
1914 ..	18·62	38·26
1915 ..	16·40	64·60

H. M.

HOLMES (William H.) **Remarks on *B. Welchii* in the Stools of Pellagrins.**—*Arch. Intern. Med.* 1916. Mar. 15. Vol. 17. No. 3. pp. 453–458.

A paper written with the object of directing attention to the fact that abnormally large numbers of organisms belonging to the *B. Welchii* group have been found in the stools of pellagrins, and to enquire whether these organisms may not bear some relationship to the disease. It is pointed out that diarrhoea is always a marked symptom in pellagra. The pellagrins in which this bacillus was found were living on a diet rich in carbohydrates but deficient in protein especially of animal origin. In the presence of high carbohydrate diet the *B. Welchii* has been found to produce diarrhoea in children and adults. This diarrhoea can be cured by a diet of protein and buttermilk. GOLDBERGER prevented pellagra by the addition of proteins and buttermilk to the diet, while he produced pellagra experimentally by means of a high carbohydrate diet. Though it is not known whether the *B. Welchii* was present in large number in GOLDBERGER'S experiments, it is yet worth further investigation to ascertain whether or not this organism plays any part in the etiology of pellagra.

H. M.

SYDENSTRICKER (Edgar). **The Prevalence of Pellagra. Its Possible Relation to the Rise in the Cost of Food.**—*U. S. Public Health Rep.* 1915. Oct. 22. Vol. 30. No. 43. pp. 3132–3148.

A statistical review of the economic conditions and their effect on the quantity and nature of the diet in different parts of the United States. It is suggested that the prevalence of pellagra in certain districts may, probably, be dependent on the nature of the food supply, which in turn is directly related to the special conditions operating in the different districts.

H. M.

GROTE (Carl A.). **Pellagra. Diet as the Essential Element in its Cause and Cure.**—*Southern Med. Jl.* 1916. Mar. Vol. 9. No. 3. pp. 227–229.

From evidence obtained in Walker County the author arrives at the following conclusions concerning the etiology of pellagra :—

"1. Well nourished people do not have pellagra.

"2. The diet of our backward farmers, and farmers who have moved to the mining camps, has undergone a serious deterioration in nutritive value during the past few decades.

"3. In our cases of pellagra there is the sameness of diet, excessive in carbo-hydrates and deficient in nitrogenous elements.

"4. Pellagrins as a class do not own cows, consequently are deprived of milk.

"5. A well balanced nutritious diet, in addition to almost any medical treatment with its psychic effect, will cure most cases of uncomplicated pellagra."

H. M.

GREEN (E. M.). **Pellagra Investigations in the Georgia State Sanitarium for the Insane.**—*Southern Med. Jl.* 1916. Mar. Vol. 9. No. 3. pp. 230–231.

An account of the result of GOLDBERGER'S experiments [see this *Bulletin*, Vol. 7, pp. 51 and 52]. The author asserts that these experiments "have proved beyond doubt that the employment of suitable diet alone may bring about the recovery of cases not too far advanced and that it will prevent, for a time at least, recurrences of this disease."

H. M.

MOORE (H. Leslie). **Pellagra Commission of Dallas Medical and Surgical Society. Report of Committee on Prevention and Treatment.**—*Southern Med. Jl.* 1916. Jan. Vol. 9. No. 1. pp. 16–17.

A statement of the results arrived at by a committee appointed "to investigate the literature, to talk with those who have been devoting a great deal of time and study to this subject and to present some conclusions." The conclusions arrived at are that the most likely cause of pellagra is to be found in deficient diet, and that this theory has been very materially strengthened by the experiments of Dr. GOLDBERGER [see this *Bulletin*, Vol. 7, pp. 51 and 52].

Dr. GOLDBERGER'S suggestions as to diet are recommended.

H. M.

ALLISON (W. L.) **Pellagra Commission of Dallas Medical and Surgical Society. Report of Committee State-at-Large.**—*Southern Med Jl.* 1916. Jan. Vol. 9. No. 1. pp. 17–20.

In the report of a committee appointed to study and investigate pellagra, the following observations are made. The disease came to Texas from Italy. There is no evidence that pellagra was present in Texas prior to 1906; since then it has spread largely through all the southern states of America. The disease is not directly contagious and deficient diet is probably a pre-disposing factor, but will not account for cases present in well to do people, which are fairly common in Texas, nor explain its sudden incidence and rapid increase in the country. The fact that mild cases sometimes refuse to respond to a well-balanced diet further strengthens the view that the cause is not entirely dietetic. Pellagra seems to be an infection and an insect borne disease. Heredity appears to play no part in its etiology. It is more common in women than in men, and morphine habitués seem to be especially susceptible. Various suggestions as to treatment are discussed.

H. M.

LEHMANN (John R.). **Report of Pellagra Clinic held in Dallas, Texas, in Connection with Meeting of the Southern Medical Association, November 8-11, 1915.**—*Southern Med. Jl.* 1916. Jan. Vol. 9. No. 1. pp. 42–44.

A report of a pellagra clinic in which several points dealing with the etiology and treatment of pellagra were discussed. In Texas the annual death-rate due to pellagra is about 500, while the number of cases amounts to from forty to fifty thousand.

H. M.

DEARMAN (W. A.). **The Further Consideration of the Etiology of Pellagra with Reference to Amebic Invasion.**—*Southern Med. Jl.* 1916. Jan. Vol. 9. No. 1. pp. 24–29.

The author discusses the amebic and deficient diet theories of pellagra and comes to the conclusion that GOLDBERGER'S results [see this *Bulletin*, Vol. 7, pp. 51 and 52] supporting the deficiency idea are not final. He suggests that the disease is probably due to amebic invasion. As an offset against GOLDBERGER'S conclusions the author quotes the report of the Thompson MacFadden Commission in which it is stated that an outbreak of pellagra in the State hospital at Peoria, Ill., was successfully controlled by isolation of the patients and enforcement of general cleanliness "without any change in the dietary as far as we have any record."

H. M.

BEALL (K. H.). **The Epidemiology of Pellagra,**—*Texas State Jl. Med.* 1915. Sept. Vol. 11. No. 5. pp. 268–271. With 3 figs.

A survey of the epidemiological features of pellagra in the state of Texas. The effect of race, age and sex on the incidence of the disease is discussed. The author maintains that pellagra in Texas is seen more often in females than in males and is unable to reconcile this difference with the diet deficiency theory. If the disease depended on diet, then men and women eating the same kind of food should show the same incidence of the disease.

BEALL (K. H.). **Pellagra in Texas.**—*Southern Med. Jl.* 1916. Jan. Vol. 9. No. 1. pp. 20–21.

A survey of the incidence of pellagra in Texas. The disease was first diagnosed here about eight years ago and at that time was so rare as to be of merely academic interest. Within the last eight years, however, it has increased to an enormous extent and is now responsible for many deaths. Certain aspects of the disease are discussed.

H. M.

PARRISH (C. C.). **Some Facts bearing on the Cause of Pellagra.**—*Texas State Jl. Med.* 1916. Jan. Vol. 11. No. 9. pp. 487–488.

A discussion of the probable etiology of pellagra. The view held is that pellagra is an infection, and that the infection is communicated through the medium of the soil surrounding the household.

H. M.

PARRISH (C. C.). **The Soil as a possible Medium for the Etiological Factor of Pellagra.**—*Southern Med. Jl.* 1916. Mar. Vol. 9. No. 3. pp. 229–230.

A paper advocating the view previously expressed by the author that pellagra is probably caused by some ultra microscopical germ in the soil of the yard or garden surrounding the habitations of pellagrins. It is pointed out that little or no pellagra is present in cities where people are not exposed to the soil, whereas in rural districts where

the sanitary arrangements are often of a crude kind the greatest proportion of the disease is found. The author maintains that throughout the history of the scourge all writers are agreed "that workers in the earth living in rural districts are almost exclusively the class of people affected."

H. M.

PAGE (B. W.). **Etiology of Pellagra.**—*Med. Record.* 1915. Nov. 13. Vol. 88. No. 20. Whole No. 2349. pp. 826–827.

The author claims to have isolated a special organism from the faeces of pellagrins. This organism he observed in more than 600 specimens of faeces from cases of pellagra, while in six normal stools examined, the results were negative.

"One of the several healthy persons previously examined with negative results, after accidental exposure in a laboratory, developed symptoms of grippe which later proved to be pellagra. The organism was isolated from the stool on the third day after symptoms developed. The organism was again isolated from the stool eight and twelve months later. Symptoms of the disease still exist."

Some special features in connection with the morphology, cultivation and growth of the organism are given.

H. M.

SILER (J. F.). **Medical Notes on Barbados, British West Indies Part II. Pellagra in Barbados.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Oct. Vol. 3. No. 4. pp. 186–221. With 3 maps & 1 chart.

An investigation into the conditions of life and prevalence of pellagra in Barbados. In general, the sanitation is primitive and soil pollution is universal. Most of the corn used is kiln-dried and imported from the United States; there is no evidence that the amount of corn meal used now is more than was used 30 years ago and the general diet seems to be the same as that eaten by former generations. This is interesting in view of the fact that pellagra has enormously increased within the last twelve years, and suggests that diet hardly accounts for the disease. The geographical distribution of pellagra showed marked inequalities which could not be accounted for, as it did not seem to depend on differences in diet or other conditions. The author suggests "that pellagra is an infectious disease communicated from person to person, possibly through contamination of food with the excretions of pellagrins."

H. M.

SILER (J. F.). **Medical Notes on Jamaica, British West Indies. Part II. Pellagra in Jamaica.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. Mar. Vol. 3. No. 9. pp. 481–499. With a map & 2 figs.

A very full account of the history, prevalence and geographical distribution of pellagra in Jamaica. In collecting this information, the author kept in view the three most plausible theories as to the etiology of the disease—deficiency, intoxication and infection. The most interesting observations made were as follows:—

Pellagra was found to be plentiful in two institutions on the island—the Lunatic Asylum and Manning Home—but was very rare elsewhere.

Although many charity hospitals have been erected in different parts of the island for the care and treatment of indentured labourers, only two suspected pellagrins were found in these institutions. Pellagra was also not present to any extent in the district almshouses. The disease has occurred in endemic form in the Jamaica Lunatic Asylum for many years, and "the specific agent causing the disease is unquestionably active at this institution, as many of the inmates had not acquired the disease until several years after commitment." Although the diet seemed to be lacking in fresh meat, it appeared to be more varied and better balanced than the diet used by the general inhabitants of like class. The diet of the native population of Jamaica is poor, and if deficient diet were the cause of pellagra the disease might be expected to be very common on the island. This however was not the case. The distribution of pellagra in Jamaica is "very suggestive of a low grade infection in which poor nutrition plays an important part as a predisposing factor." No evidence in support of SAMBON's Simulium theory could be obtained.

H. M.

McDONALD (W. M.). **Notes on Pellagra.**—*Jl. Trop. Med. & Hyg.* 1916. Jan. 15. Vol. 19. No. 2. pp. 17–20.

A short review of pellagra in which the author comes to the conclusion, as the result of personal observations in Antigua and a study of the literature, that the cause of pellagra is a deficient or ill-balanced diet. Contrary to the statements of certain observers the author maintains that the intensity of the skin lesions bears a definite relationship to the severity and progress of the disease.

H. M.

JADASSOHN (J.). **Ueber den pellagrösen Symptomkomplex bei Alkoholikern in der Schweiz.** [On the Symptoms of Pellagra occurring in Alcoholics in Switzerland.]—*Correspondenz-Blatt. der Schweiz. Aerzte.* 1915. Vol. 45. No. 52. pp. 1641–1654; 1916. Jan. 1. Vol. 46. No. 1. pp. 15–26.

The first publication gives a detailed account of four cases of obscure illness seen at the author's clinic, which he diagnosed as pellagra; in three of these a well-marked history of alcoholism was obtained, and in the fourth case, though no such history was at first forthcoming, it was subsequently ascertained that the patient was a heavy drinker. The author agrees that alcohol can of itself give rise to symptoms which may to a certain extent simulate pellagra, and make a differential diagnosis exceedingly difficult. In this connection MERK's monograph (Innsbruck, 1909) is quoted, and the various points raised by MERK are discussed and criticised. MERK's suggestion, that cases with symptoms of pellagra arising in alcoholics may not be true pellagra but "pseudopellagra" is considered, but the idea of such a pseudopellagra accounting for the symptoms present in the author's cases is rejected. For various reasons, fully indicated in the paper, he maintains that they were undoubtedly cases of true pellagra. This association of alcoholism with pellagra suggests the possibility that alcohol may play a part in the etiology of the disease. No connection between maize diet and pellagra could be established in any of the cases.

In the second publication the etiology of pellagra is further discussed and the various theories considered. It is pointed out that pellagra may be divided into three classes of cases.

(1). The well-known outbreaks of pellagra in which large numbers of people are affected. Such outbreaks are common in Roumania and Italy. Here maize almost certainly plays some part.

(2). Sporadic cases sometimes arising in patients who are well off and have abundance and variety of good food. These cases are often associated with alcoholism.

(3). The endemic form occurring in various institutions.

Assuming that alcohol may play some part in causing the disease, the suggestion is made that alcoholism may only produce pellagra when the alcohol is made from maize or bad maize. Such an idea has been advanced by Lombroso, and Neusser points out that in Roumania spirit is often made from maize so spoiled as to be unfit for animal consumption. Here pellagra has recently made rapid strides, and since Roumanian "schnapps" is exported to all European states, sporadic cases might thus be accounted for.

It is proved that all the cases mentioned in the first paper might have obtained alcohol made from maize, since during the last few years maize has been used in Switzerland for the distillation of spirits. The author inclines to the view that alcohol made from spoiled maize may really constitute a large factor in the etiology of pellagra, and recommends the necessary countermeasures.

H. M.

Galli-Valerio (B.). **Zur Frage der Pellagra in der Schweiz.** [Pellagra in Switzerland.]—*Correspondenz-Blatt d. Schweiz. Aerzte.* 1916. Feb. Vol. 46. No. 6. pp. 181–182.

Attention is drawn to the fact that several cases of pellagra associated with alcoholism have been diagnosed in Switzerland in recent times. The author takes the view that the disease is associated with some defect in diet, and favours the idea that pellagra is the result of toxic products present in spoiled maize. The theory that these deleterious products may be present in the liquors distilled from spoiled fermented maize is favoured.

H. M.

Rondoni (Pietro). **Alcune considerazioni sulla pellagra, la sua oziologia e la sua prevenzione e cura.** [Considerations on Pellagra, its Etiology, Prevention and Cure.]—*Policlinico.* Sez. prat. 1915. Nov. 21. Vol. 22. No. 47. pp. 1569–1572.

A discussion of the etiology of pellagra in which the author inclines to the view that pellagra is a deficiency disease. It is pointed out that the disease though prevalent in maize-eating countries also appears in countries where maize is little used. Pellagra is not necessarily associated with maize, and may appear under conditions of defective diet, irrespective of the nature of the individual articles comprising the diet.

H. M.

SEPPILLI (G.). **L'Opera della Commissione Pellagrologica Provinciale di Brescia dal 1 Luglio 1914 al 30 Giugno 1915.** [The Work of the Pellagrological Commission of Brescia from July 1st 1914 to June 30 1915.]—*Riv. Pellagrologica Ital.* 1915. Nov. Vol. 15. No. 6. pp. 82–84.

The Commission reports that the number of Communes infected with pellagra has diminished from 86 on June 30th, 1914 to 75 on June 30th, 1915. Under the auspices of the Commission a dietetic cure was undertaken in 58 provinces. The system of inspection of maize previously instituted was continued, and efficient arrangements for its drying and preservation were undertaken. Grants were made to pellagrous mothers during gestation and lactation. Educational propaganda was carried out.

H. M.

ALPAGO-NOVELLO (Luigi). **Sulla prima introduzione del grano-turco e la prima comparsa della pellagra nel Veneto, nella Lombardia e specie nel Bellunese.** [On the Introduction of Maize and the First Appearance of Pellagra in Venetia, Lombardy, and especially in Belluno.]—*Riv. Pellagrologica Ital.* 1915. Nov. Vol. 15. No. 6. pp. 85–92.

A historical account of the diet of the peasants in the above districts and an attempt to correlate the diet with the incidence of pellagra.

H. M.

GOLDBERGER (Joseph), WARING (C. H.) & WILLETS (David G.). **A Test of Diet in the Prevention of Pellagra.**—*Southern Med. Jl.* 1915. Dec. 1. Vol. 8. No. 12. pp. 1043–1044.

In September 1914, an increase was made in the amount of fresh animal and leguminous foods supplied in the dietary of two orphanages which had served for several years as endemic foci of pellagra. No new case occurred during the following year and only one case of recurrence among 105 pellagrins of the previous year.

Similar observations were made at the Georgia State Sanitorium [see this *Bulletin*, Vol. 7, pp. 51 and 52].

H. M.

WILLETS (David G.). **The Treatment of Pellagra by Diet.**—*Southern Med. Jl.* 1915. Dec. 1. Vol. 8. No. 12. pp. 1044–1047.

An account of 43 cases treated at the Georgia State Sanitarium by a generous dietary rich in protein; of 30 cases, 11 improved, 17 recovered, and 2 died. The author considers these results particularly encouraging in view of the difficulties experienced in dealing with insane patients.

H. M.

WILSON (W. T.). **Drugs in Pellagra.**—*Southern Med. Jl.* 1916. Jan. Vol. 9. No. 1. pp. 21–24.

A paper dealing with the treatment of pellagra and the management of pellagrins. For its beneficial effects, especially on the intestinal symptoms, picric acid is recommended in doses of 1/2 dram of 1 per cent. aqueous solution every six hours; in some severe cases as much as 1 dram may be given. If depression appears the dose must be reduced.

H. M.

SECCOR (Wm. Lee). **Some Observations on the Etiology, Symptomatology and Treatment of Pellagra.**—*New Orleans Med. & Surg. Jl.* 1916. Mar. Vol. 68. No. 9. pp. 580–582.

The author in conjunction with Dr. E. E. PALMER has obtained good results in the treatment of pellagra by the use of "autoserotherapy" [see this *Bulletin*, Vol. 7, p. 62]. Along with this special treatment tonic doses of arsenic are generally of service. Many of the first cases were treated by autoserotherapy without any change in their food, but now the patients are given a well balanced diet, no canned goods being allowed. The authors claim good results in cases where prolonged drug treatment along the usual lines had entirely failed.

H. M.

ALESSANDRINI (Giulio) & SCALA (Alberto). **Risultati di alcune esperienze curative della pellagra col citrato trisodico.** [The Cure of Pellagra by Trisodium Citrate.]—*Policlinico.* Sez. prat. 1916. Jan. 16. Vol. 23. No. 3. pp. 71–76.

In support of the theory that colloidal silica in water may be the cause of pellagra, the authors have carried out experiments to test the effect of intramuscular injections of trisodium citrate on pellagrins. Satisfactory results were obtained.

H. M.

HENDERSON (D. K.). **Pellagra. Report of a Case.**—*Rev. of Neurolog. & Psychiat.* 1915. Dec. Vol. 13. No. 12. pp. 579–586.

A full description of a case of pellagra in the west of Scotland. The patient presented all the typical symptoms of the disease. An interesting point is that she had never been fond of meat and for two years before her admission to hospital had lived practically on tea and bread and butter.

H. M.

PINAULT (L. G.). **Pellagra.**—*Canadian Med. Assoc. Jl.* 1916. Mar. Vol. 6. No. 3. pp. 228–232.

A short account of the symptoms, course and treatment of pellagra. A fatal case in a woman of 22 is recorded; this is said to be the first case of the disease described in Canada.

H. M.

WISE (Fred) & LAUTMAN (M. F.). **Pellagra in New York and its Vicinity; With Report of Two Cases.**—*Jl. Cutaneous Dis. including Syph.* 1915. Nov. Vol. 33. No. 11. Whole No. 398. pp. 760–764. With 2 plates.

A clinical account of two cases of pellagra in New York where the disease is very uncommon. Only three cases of pellagra indigenous to New York State have been previously recorded.

H. M.

LORENZ (W. F.). **Mental Manifestations of Pellagra.**—*U. S. Public Health Rep.* 1916. Feb. 4. Vol. 31. No. 5. pp. 221–246.

A careful analysis of the nature of the mental disturbances present in pellagra. Cases where there was evidence that the disease was preceded by a previously existing psychosis were excluded. Of cases where no history of previous mental disturbances was present, 167 were investigated and presented symptoms which allowed of a classification under the following types :—

Confused = 84 (51 per cent.)
Delirious = 63 (38 per cent.)

while 16 (10 per cent.) gave a clinical picture that " resembled either dementia precox (11 cases) and senility or arteriosclerotic dementia (5 cases)."

Since, from the nature of the cases, many more delirious types must be admitted to institutions for the insane than the confused type, it would appear that the delirious type is much less common than the confused type. The average duration of the disease prior to the manifestation of mental disturbances was two years. The shortest period between the onset of mental symptoms and the first definite sign of pellagra as indicated by the dermatitis was 10 days, while the longest period was 20 years. As many as 90 per cent. of uncomplicated pellagrins admitted to institutions for the insane present a mental picture characterised by disturbances of orientation. This is accompanied by such manifestations as " clouding of the mind, confusion of thought, visual and auditory hallucinations, apprehension, defective retention and a subsequent amnesia restricted to the period of the greater disorientation; furthermore, the periods of confusion or delirium tend to appear as episodes of varying duration." Since similar mental symptoms are found in the mental disturbances associated with intoxications and infective or exhaustive states, it is recommended that pellagrous mental states should be regarded as belonging to the group of toxic psychoses. The mental derangement produced by alcohol furnishes a good example of the toxic psychoses and there is a distinct resemblance between this condition and that of pellagra. This is not clinical only, for characteristic axonal degeneration of brain cells is found in both conditions; according to COLE beriberi gives the same type of lesion. Other clinical manifestations common to alcoholism and pellagra are mentioned. The conclusion arrived at is, that the symptoms present in pellagra are not the result of an infection, but are caused by a toxic substance of a chemical nature similar to alcohol in that it has specific deleterious properties.

[Since beriberi shows certain manifestations of a toxic psychosis, its classification as a toxic disease would be supported by the above conclusions. It is now, however, universally acknowledged that beriberi is a deficiency disease; it is therefore doubtful whether the mental manifestations of pellagra can be safely applied to throw light on its etiology.]

H. M.

BAGLIONI (S.). **Recherches sur les effets de l'alimentation maidique.**—*Arch. Ital. de Biol.* 1915. Sept. 25. Vol. 63. No. 2. pp. 177–219.

The author describes a series of experiments on feeding with the proteins of wheat, maize and egg, the metabolism being investigated in the usual manner. Egg protein is shown to be the most satisfactory of these substances. Zein and gliadin were less efficient than the mixed proteins of the grains from which they are respectively derived. Complete tables of the author's results are furnished. It is hoped that such investigations will throw some light on the problems of pellagra.

H. M.

YOUNG (Beverly). **The Blood in Pellagra.**—*Southern Med. Jl.* 1916. Jan. Vol. 9. No. 1. pp. 29–31.

As a result of blood examinations in a large number of pellagrins the author concludes that well marked and persistent lymphocytosis is a constant feature of pellagra; this condition is present long after the acute symptoms have subsided. Indeed, in the main, the cases have a higher lymphocyte count after the acute symptoms have passed over than during the acute stage. Since a similar lymphocytosis accompanies other chronic infections such as syphilis and tuberculosis the author suggests that pellagra is also an infection of a chronic nature. Of 39 cases examined 10 gave a positive Wassermann reaction.

H. M.

LAVINDER (C. H.). **The History of Pellagra. Some of the Salient Points.**—*New York Med. Jl.* 1915 Dec. 11. Vol. 102. No. 24. Whole No. 1932. pp. 1169–1172.

An interesting paper dealing with the history of pellagra, especially with regard to the earliest writings on the subject. There is a good deal of evidence advanced by the earlier observers that the disease is not contagious. Thus STRAMBIO, writing towards the close of the eighteenth century, observed that the scales from pellagrins might be eaten with impunity, the same room and bed shared, and even the same spoon used without the disease being contracted. STRAMBIO and his predecessors and contemporaries all held the view that the principal cause of the disease was to be looked for in bad food. Though many different suggestions have been put forward since STRAMBIO's day, we are now practically agreed that the problem of pellagra is definitely associated with incomplete diet, but the exact nature of the deficiency is still obscure.

H. M.

MISCELLANEOUS.

BOUILLIEZ (Marc). **Contribution à l'étude et à la répartition de quelques affections parasitaires au Moyen Chari (Afrique Centrale).** *Bull. Soc. Path. Exot.* 1916. Mar. Vol. 9. No. 3. pp. 143–167. With a map and 6 text-figs.

**Leishmaniasis.*—In August 1915 two natives of Fort Archambault presented themselves with oriental sore. They stated that they had not left their village for a long time; each had two ulcers, situated in one case near the elbow and on the forearm, and in the other on the wrist and knee. *L. tropica* was easily seen in stained smears. Inoculations were made into monkeys and good sores were produced in Cynocephalus and patas. Geckos and lizards were examined for parasites, but none were found which could have any relation to *L. tropica*, nor did several geckos which were inoculated show any parasite in the blood. It is noted that in this instance a rocky soil, which CHATTON believes to be a feature of tropical sore districts, was not concerned [this *Bulletin*, Vol. 3, p. 557]. The author thinks that this disease is more frequent than appears; he suggests that patients do not present themselves for treatment till the sore has been transformed into a phagedaenic ulcer, which is very common, and in which it is no longer possible to discover the parasites.

Malaria.—The author sought to establish the endemic index from the study of blood smears from children under five. Of 916 smears 738 were positive, or 80·5 per cent. The figures vary, but not greatly, for different localities. These figures are compared with those obtained in other parts of French African possessions. An endeavour was made to classify the parasites according to species; it is pointed out that for various reasons the results cannot be regarded as very exact. "*Plasmodium praecox*" was found 678 times, *Plasmodium vivax* 49 times and *Plasmodium malariae* 11 times. Mosquitoes were collected in all districts and at every season, and nearly always proved to be *Myzomyia funesta*.

Plasmodium kochi.—This parasite was found once in a Callitrichus monkey. The gamete forms were seen for three weeks before its death and flagellation was several times observed. Inoculations were made into three callitrichus and one patas, but without result. The parasites are figured.

Filariasis.—Guinea-worm is rare, especially as compared with the Baguirmi district in the Lake Chad direction, where it is extremely common. *Filaria volvulus* is also rather rare. On two occasions sheathless microfilariae were found in the blood which the author believed to be *volvulus*, though no tumour was present. To obtain the endemic index of the various filariae the author examined two groups of natives from various districts. In 217 blood examinations made at night *Microfilaria nocturna* was found 47 times or 21·56 per cent. In 181 made in the day *Microfilaria diurna* was found 4 times or 2·2 per cent. *Microfilaria perstans* was very common. In 181 examinations it was found 64 times or 35 per cent., and still more often in night blood. Comparisons are made with the endemic index in other parts of French Africa.

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*The paper opens with a section on Trypanosomiasis, which has been dealt with elsewhere (p. 277).

Goitre.—A large number of goitrous subjects was found in the Bédioudo sub-division [see map]. In some villages near Goundi nearly 80 per cent. of the population were attacked. The disease affects men, women, children, dogs, goats and perhaps horses; it is said to be spreading. It was observed amongst various native races. The author does not think that it can be attributed to any physical or chemical property of the drinking water. He says the country is a kind of plateau, little raised and traversed by marshy rivers. Inoculations were made into goats, puppies and monkeys, but with no result. The author is inclined to think the disease is of parasitic origin; he cites the case of a child which suffered from fever for a month without evidence of malaria, the fever being followed by goitre. He says also that he discovered a reduviid bug in this district, *Acanthaspis sulcipes*, Fabr.

A. G. B.

RODHAIN (J.). **Quelques aspects de la pathologie indigène dans l'Ouellé.**—*Bull. Soc. Path. Exot.* 1915. Dec. Vol. 8. No. 10. pp. 734–745.

The observations here recorded were made during a journey taken by the author in this district for the purpose of studying sleeping sickness. The Ouelle district is in the north-east of Belgian Congo.

Malaria.—The author gives a table of spleen examinations. Of 810 children examined in seven places, 65 of whom were between six months and two years and 745 between three and seven, 75 per cent. of the first class had enlarged spleens and 56 per cent. of the second, or an average of 58·2 per cent. It is concluded that the disease is very prevalent both in the savannah and in the forest districts. As in most tropical countries the adult native enjoys only a relative immunity and gets slight attacks of fever. The author has seen natives who were severely attacked by the disease even in their own country; two such cases are cited. He supposes that an intercurrent disease had lowered their resistance. In all parts of the Ouelle district he was able to find Anopheles. In stations built near the Ouelle river Culicidae were more abundant in the dry season than in the rains; this is explained by the fact that when the water falls stagnant pools are left amongst the rocks, in which the mosquitoes breed.

Leprosy.—Leprosy was met with throughout the district. The author saw 56 lepers, eight of whom had the tubercular form, two the mixed form and 46 the nervous form. According to the observations of LEBOEUF and SALOMON in New Caledonia the predominance of the last-named form marks the decline of the epidemic stage. A more careful enquiry is necessary to show if this is the case in the Ouelle district.

Pulmonary tuberculosis.—This disease is definitely established in the large towns, Boma, Leopoldville and Stanleyville. Seven cases were seen in the Ouelle district. Details are given wherein it is shown that one was an old soldier, another a boy who had lived with him, two others natives who lived where there was a rest house for Europeans, and another belonged to a mission; nearly all in fact had come in contact with Europeans.

Goitre.—The type of goitre seen was benign or mountain goitre. The tumours were not very big. Women are attacked rather than men, and children below ten are free [cf. this *Bulletin*, Vol. 5, p. 435, where it is written of the distribution of goitre in India (McCarrison)—It is very rare in children under eight and is much more common in women than men.] In one part of the district the disease is extremely frequent; 20 women had it out of 38 examined.

Elephantiasis and Filaria volvulus.—In this district the situation is analogous to that described by Ouzilleau for the Upper Oubanghi [see this *Bulletin*, Vol. 1, p. 420]; that is to say, there is a relatively great frequency of elephantiasis amongst the natives, corresponding to the general presence of *Onchocerca volvulus*. In 13 persons infected with *O. volvulus* the microfilariae were found in the inguinal or crural glands. In six cases carefully examined the author was not able to find the worms in the blood before or after centrifugation; he thinks that their presence in the blood is infrequent. He examined from the volvulus point of view all the bearers of enlarged cervical glands who were punctured for trypanosomes. Of 72 natives so examined 50 had volvulus tumours, which he thinks indicates that this filaria may be a contributory cause of swollen glands in the neck. The swelling is characterised by the presence of two or three moderately enlarged glands, somewhat hard, containing on puncture syrupy yellowish fluid in which the filariae are found. Lymphocele is common and elephantiasis of the scrotum is more frequent here than in any other part of Belgian Congo. One case was observed in a boy of six. As to whether *O. volvulus* plays any part in the production of elephantiasis he does not come to any conclusion.

Bilharziasis and Amoebiasis.—*Schistosoma mansoni* was met with twice in natives and once in a European. Amoebic dysentery on the other hand is common and widespread.

Banga.—Under the name of "banga" certain tribes designate an hysterical affection which chiefly affects women from the age of puberty and resembles the "latah" of the Malays. Influenced by some emotion such as fright or anger the patient suddenly utters a loud cry and falls to the ground, his body shaken with convulsions; then he gets up suddenly, rushes across the village, uttering strident sounds and escapes into the savannah or forest, sometimes going far from the frequented paths. As a rule he is stopped by his relatives; he then changes his direction and goes on till, exhausted, he is brought up against a hut where convulsions put an end to the crisis. This may recommence a short time after and be repeated several times in the day. Another form not infrequent is accompanied by aphasia, which may be complete, the patients being absolutely silent for some months. One case was seen in a young woman. The author cures these cases by suggestion. In the young woman aforesaid stigmata of hysteria was sought, but nothing was found except slight diminution of the sensibility of the pharyngeal mucosa.

Relapsing Fever.—This disease has not yet made its appearance, but it is to be feared that it will follow the introduction of *Ornithodorus moubata* from Uganda.

A. G. B.

FORSYTH (Charles E. P.). **Coolie Anaemia.**—*Indian Med. Gaz.* 1915. Dec. Vol. 50. No. 12. pp. 453–455.

The author, who writes from Tezpur, Assam, states that in the medical care of coolie labour on Assam tea estates anaemia is one of the chief diseases to be contended with. "Coolie anaemia," he finds, is associated with ankylostomiasis, malaria, any debilitating disease such as dysentery and colitis, pregnancy and lactation, "famine disease," and excessive or ill regulated manual labour. Large numbers of cases have to be dealt with and strict individual treatment is often hard to apply. The following is the author's account of the methods he has found useful:—

"A general muster of the labour force in each garden is held every quarter when, in the first place, all apparent cases of anaemia are freely selected by inspection. The haemoglobin index of each of these is then taken with Tallquist's Haemoglobin Scale, which affords a ready and sufficiently accurate means. All persons showing an index of 70 or over are passed as in this respect fit, and those with an index below that figure are listed for routine treatment, known malarial cases being placed in a separate "spleen" list, and known cases of other distinct diseases being reserved. Indices of below 50 are specially noted, and all, if any, below 40 go immediately to hospital.

"Subsequently, the haemoglobin index of all on the anaemia list is taken regularly every fortnight, and the figures carefully recorded. All who show under treatment an index of 70 on two consecutive examinations, or who once reach 80 are discharged recovered. Cases that do not respond to the routine treatment are marked for further investigation. A certain number of these are found to require active anthelminthic treatment, some are sufferers from chronic malaria and a few may require some special treatment in hospital or some degree of change of work."

The routine treatment is a "mixture of sulphate of iron, sulphate of magnesia and nux vomica given twice daily." Coolies with a haemoglobin index of 50 or under get also izal, 10 minims twice daily in an ounce of water, which is said to yield excellent results. For anthelminthic treatment beta-naphthol is preferred, given in drachm doses, 25, 20 and 15 grs. at intervals of an hour, preceded and followed by a purgative. This treatment is repeated at intervals of 4–7 days till the worms disappear from the stools. The precaution is taken of examining the patient's urine for albumin and the treatment is always carried out in hospital. Cases of anaemia due to chronic malaria, accompanied by enlargement of the spleen, have treatment with quinine combined with iron and arsenic.

The author states that the number that respond rapidly to simple routine treatment is, as a rule, great; there is however an obscure class of case in which the results are not satisfactory. "Here dropsy is always a prominent feature, rise of temperature may be present, but is usually not found, blood films and counts give no definite information, no changes are discoverable in the nervous system, and nothing seems especially to point to anaemia of this type being either a deficiency disorder, due to food poisoning, or of parasitic origin."

In a period of three years slightly over 23 per cent. of anaemic coolies had special anthelminthic treatment; in 67 per cent. ankylostoma was found. In an average labour force of 6,443 the incidence of coolie anaemia has fallen in three years from 18·8 per cent. to 15 per cent. It is noted that the prospect of efficient conservancy arrangements is exceedingly remote.

A. G. B.

KERSTEN (H. E.). **Zur Frage des Bevölkerungsrückganges in Neupommern (Deutsch-Neuguinea).** [Is the population of New Pomerania decreasing ?]—*Arch. f. Schiffs.- u. Trop.-Hyg.* 1915. Nov. Vol. 19. No. 21. pp. 561-577.

In 1913 KOPP published an article under the above title [see this *Bulletin*, Vol. 3, p. 283] giving his observations made in the north of New Pomerania, which is the principal island of the Bismarck Archipelago and contains nearly 9,500 square miles. He concluded that there was a decrease of population and attributed it to the backward state of civilisation (*Unkultur*) and to epidemics. The author's observations were made in the island of Neu-Lauenberg, eastward of New Pomerania, and in the Sulka settlement in the Gazelle peninsula of the latter island. These areas contain different races, Kanakas and Sulkas. As regards the Kanakas, if the population is decreasing, this is not due to degeneration and inbreeding as is usually assumed: In 1910 there were 608 children to 1,000 adults (the observations concerned nearly 20,000), which, the author thinks, makes a decrease of population very improbable [limit of age of " children " not stated]. In Neu-Lauenberg women over 40 were questioned as to the number of children they had borne; 92 had had 393 or 4·27 children apiece and only eight had not borne children, statistics which, the author states, are similar to those of Germany [there are obvious fallacies in such a method of inquiry]. In the first four years of life 119 children died, and later another 69, in all 47·8 per cent. Many Kanakas fall victims to epidemics; old people are rarely seen.

Records of the diseases prevalent were made in the neighbourhood of Rabaul. Sores on the leg and foot of a serious character are common and appear often, in the older children, to lead to death; salvarsan and neosalvarsan fail, though the organisms of ulcus tropicum are found. Yaws is common, but light in character; the natives recognise the value of salvarsan and take intravenous injections willingly. Malaria in all its forms occurs. Dysentery claims numerous victims; the water supply is insufficient. The bacillary form is chiefly met with, the amoebic form in only a small number of cases. The disease is often associated with ankylostomiasis, especially in cases rebellious to treatment. Ankylostomiasis is very widely spread. Tinea circinata and tinea imbricata are wide spread and occur chiefly in anaemic and badly nourished people. " Infectious conjunctivitis " is common and leads often to complete blindness. Tuberculosis is not common and is certainly not yet epidemic. Gonorrhoea is very common especially round stations, but syphilis was not seen. Venereal granuloma is found, chiefly in natives from Neu-Mecklenburg; salvarsan is of no value. Leprosy is very rare and beriberi is only seen in labourers who live on faulty rice. The author thinks that extensive hygienic measures will prevent a decrease of population, if such should tend to be brought about in the Kanakas by infectious diseases.

The conditions met with among the Sulkas, on a single visit, are dealt with more shortly. These people are well nourished and live in clean well-built houses, but they keep large numbers of pigs in them and bury their dead under the floor. The conditions of water supply are bad. There is no evidence that the numbers are decreasing (892

only were seen), but of recent years the mortality has increased, which the author attributes to withdrawal of the young men for labour, to the detriment of the nourishment and housing of those left behind. The diseases chiefly observed were malaria and yaws. Of 104 submitted to von Pirquet's test 34 reacted. He suggests that recruiting among the Sulkas be suspended. Positive recommendations are added.

A. G. B.

POST (D. C.). **Some Medical Aspects of the Upper Yangtze River Country.**—*U. S. Nav. Med. Bull.* 1915. Oct. Vol. 9. No. 4. pp. 620–629. With 2 maps.

The author, who is an Assistant Surgeon, U.S. Navy, gives a resumé of one calendar year 1913–14, in the Deutsche Poliklinik, Chungking, from data furnished by Dr. Paul ASSMY.

A clinical or laboratory diagnosis was made in 4,787 cases. Under heading Infectious Diseases there were nine cases of *typhoid*, including four British sailors: 56 cases of *dysentery*, 38 of which were amoebic and the rest part flagellate and part bacillary. The spread of the disease is believed to be due to flies. Of *malaria* there were 30 cases, 26 tertian and 4 aestivo-autumnal. *Relapsing Fever*, 7 cases. *Rheumatism*, 156 cases. *Beriberi*, 3 cases. *Unclassed Fevers*, 35 cases. Tumours of spleen of unknown origin 7 cases; no organisms found, cultures negative. *Leprosy*, 4 cases. No *filariae* were found. The helminth findings are tabulated: *ankylostomes* were found 109 times in 752 examinations. Only three cases were in females. "The disease is universal among trackers, water coolies and laborers, who go about barefooted. Women bind their feet and thus do not expose them." *Schistosomiasis* has not been seen above the gorges of the Yangtze by Dr. ASSMY. *Gonorrhoea* was seen in 176 cases, *syphilis* in 521 (30 congenital, 32 tertiary, and 459 primary and secondary). *Eye diseases* were common. *Otitis media* (mostly tuberculous), 78 cases. Scabies, ringworms, impetigo were common. Twelve cases of "*frost-bite*" were seen, though the temperature never goes down to freezing point. Of *ulcus tropicum* there were 21 cases. Pulmonary *tuberculosis*, 104 cases; skin tuberculosis, 84; tuberculosis of glands, 103; of joints, 27. The use of cows' milk is practically nil.

Chungking is about 29·5° north latitude. It is built almost entirely upon solid rock. Its wall includes one square mile and approximately 450,000 people. Refuse is cleared away by the violent rains. The summer temperature averages 102° in the shade.

[It is interesting to compare these findings with those of VADON at Yunnan-Fou (this *Bulletin*, Vol. 5, p. 376), which would appear to be much less visited by disease.]

A. G. B.

LUTZ (Adolpho) & MACHADO (A.). **Viajem pelo rio S. Francisco e por alguns dos seus affluentes entre Pirapora e Joazeiro.** [A Journey to the River S. Francisco and some of its Affluents between Pirapora and Joazeiro.]—*Mem. Inst. Oswaldo Cruz.* 1915. Vol. 7. No. 1. pp. 5–50. With 18 plates.

The report of a journey made by two of the staff of the Instituto Oswaldo Cruz through the region watered by the river San Francisco,

in Brazil, in search of foci of endemic disease, and for the collection of mosquitoes and other biting insects. The diary of Dr. Lutz, which is printed at length, makes interesting reading, but unfortunately British maps of Brazil are not on a sufficiently large scale to follow the wanderings of the party in any detail. The Brazilian names for most of the animals and plants met with, are also not to be found in ordinary Anglo-Portuguese dictionaries. A list of the biting insects taken is appended.

J. B. Nias.

LAFONT (A.), DUPONT (V.) & HECKENROTH (F.)*. **Affections oculaires rencontrés en A.O.F. et essais de traitement par les sérums thérapeutiques seuls ou associés aux injections intraveineuses de Ludyl et de Galyl**—*Bull. Soc. Path. Exot.* 1915. June. Vol. 8. No. 6. pp. 404–414.

The eye diseases with which this paper deals were treated at Dakar from 1913–1915. This is a sandy district and eye affections are favoured by the quantity of dust which flies about. Other causes are the plague of flies in the hot season and the dirtiness of the natives, which is increased by the scarcity of water. The authors examined 127 cases of eye disease and treated 58. The most frequently observed lesions were—chronic conjunctivitis, sometimes of several years' duration, accompanied by granulations and opacity of the cornea; staphyloma, leucoma, phlyctenular keratitis, ulcers of the cornea, hypopyon with sometimes menace of perforation, iritis, prolapsed iris, iridochoroiditis and glaucoma. The table sums up the form of treatment.

Malades traités.	Anti-diph.	Anti-téta.	Anti-strep.	Anti-venim.	Anti-pest.	Sérum humain.	Sels arsen.	Total.
Avec un sérum thérapeutique ..	8	3	3	2	1			17
Avec un sérum thérapeutique associé aux injections de Galyl	5	2	3	5				15
Avec un sérum thérapeutique associé aux injections de Ludyl	3	2	1					6
Avec le sérum du malade ..						2		2
Avec les injections de Galyl ..							8	8
Avec les injections de Ludyl ..							1	1
Total	16	7	7	7	1	2	9	49

In every case a bacteriological examination of the secretion was first made. To the patient was then given a dilute solution of oxycyanide of mercury to bathe the eyes for two days, and then a subcutaneous injection of 6–7 cc. of serum. Some drops of the same

*In the October number of the same journal it is stated that Heckenroth's name should not have appeared as co-author.

serum were instilled into the affected eye, which was covered with a pad of wool soaked in the serum and retained for 24 hours. Under this treatment improvement took place very rapidly. All the therapeutic serums gave good results. One patient tried to bribe the attendant with five francs to get a flask of serum. Details of the cases follow. The conclusions are to this effect :—

(1) The therapeutic serums used are wonderful remedies in a large number of eye affections. The results obtained by their employment, in the case of natives, were shown to be the more efficacious the more acute the disease was and the earlier it was treated. In some less favourable cases, however, a great improvement was obtained both in the lessening of pain and in the diminishing of corneal opacity.

(2) The best results have been obtained by the subcutaneous injection of the serums, accompanied by their local application. One can without hesitation make several subcutaneous injections at a few days' interval.

(3) The employment of the serum of the patients, or of patients attacked with similar diseases, does not appear advisable owing to its rapid change and to the marked reactions which were noticed in one case out of two, but the careful study of this question should be taken up.

(4) In ocular affections which resist all treatment the results of the addition to the serums of intravenous injections of galyl or ludyl in small doses repeated several times a month (every week, every ten or fifteen days) are most encouraging. They act as powerful tonics or, in the case of old syphilitics, who are so common among the natives of French Equatorial Africa, as specifics. Galyl is preferred to ludyl ; the latter changes quickly in the tropics, the former is more stable and more active.

(5) The authors' conclusions on the value of curative serums in blacks are stated to corroborate the results of Darier.

In the discussion on this paper Morax questioned whether the authors were right in attributing the results to the serums. In regard to the details of the cases he queried the diagnosis in some instances. He was unable to convince himself of the therapeutic activity of the serums employed, and noted the absence of controls.

In the October number of the *Bulletin de la Société de Pathologie Exotique* (p. 557–60) Lafont replies in detail to the objections of Morax and concludes : We are still convinced of the activity of the therapeutic serums in eye diseases, combining subcutaneous injection with local applications and giving, or not, arsenicals intravenously according to the general state.

A. G. B.

Cassone (Giuseppe). **Il bubbone climatico nella sua sindrome, etiologia, anatomia patologica e diffusione geografica. Rivista sintetica e contributo clinico.** [Climatic Bubo, its Symptoms, Etiology, Pathological Anatomy and Geographical Distribution. A Comprehensive Review, and a Clinical Contribution.]—*Malaria e Malat. d. Paesi Caldi.* 1915. July–Aug. Vol. 6. No. 4. pp. 193–207. With 1 text-fig.

The recent occurrence of cases of climatic bubo in Southern Italy and Sicily, some of them in persons who had never been out of the country, furnishes the author with the opportunity of providing an exhaustive account of the condition for the benefit of Italian practitioners. The description given of the symptoms of climatic bubo, and the review of the opinions entertained in different quarters as to its pathology, are both very good, but do not add much to what will be found already in the most recent textbooks on tropical

medicine. In the case of Italy, many of the sufferers are sailors, belonging either to the merchant navy or to the National Marine, who have returned from a cruise in Eastern waters, and there is therefore always the lurking suspicion that the bubo may be in reality a masked form of plague, the so-called pestis minor. The differential diagnosis of these two conditions is a point which the author considers at length. Notes are furnished of two cases which came under his personal notice, and in one of these a gland was excised and submitted to microscopic examination, with negative results as regards the discovery of the causal agent. J. B. N.

LUZ (Fernando). **Bubão climatico.** [Climatic Bubo.]—*Brazil Medico.* 1915. Oct. 30. Vol. 29. No. 41. pp. 323–325; Nov. 6. No. 42. pp. 332–334.

Short notes of ten cases of climatic bubo, presenting nothing of peculiarity. In some of the cases alternate injections of nuclearsitol and iodone Robin were employed, with apparent benefit; but the author is not very explicit as to the nature of these two preparations, nor as to the indications for their employment. J. B. N.

Da MATTA (Alfredo A.). **Iodotherapia endovenosa no bubão tropical.** [Intravenous Injection of Iodides in Tropical Bubo.]—*Brazil Med.* 1915. Nov. 13. Vol. 29. No. 43. pp. 337–339.

Four cases of tropical bubo treated with massive intravenous injections of iodide of sodium with apparently good results.

Case I.—Male, aged 36 years. Admitted to hospital on the second day of symptoms, with pains all over the body, headache, vomiting and swelling of inguinal glands on both sides. Diagnosis, tropical bubo. Received, on the following day, an intravenous injection of 5 grammes of iodide of sodium; on the day following 10 grammes; on each of the third and fourth days, 15 grammes, being 45 grammes in all, in four days. No external treatment. Cure, on the 10th day. The temperature fell to normal after the third injection. Gain in weight by patient, 1·52 kilogrammes.

Case II.—Male, aged 30 years. Had suffered from malaria, and also nine years previously from blenorrhagia, which had resulted in stricture. Applied for treatment on the fourth day of symptoms, with two inguinal glands of the size of lemons. Diagnosis, tropical bubo. Given at once, endovenously, 5 grammes of iodide of sodium; on the next day 10 grammes, and on the two following days 15 and 20 grammes amounting in all to 50 grammes. Cure on the ninth day. The temperature fell on the fourth day. Gain in weight 1·07 kilo.

Case III.—Male, aged 38 years. Had suffered from bronchitis and blenorrhagia. Had had for nearly a year past fever and pains all over the body and bubo in the right groin, for which he had been treated medically with syrup of iodide of potassium. Received three injections of 10, 15 and 20 grammes of iodide of sodium. Cured in eight days. Gain in weight 1·07 kilo.

Case IV.—Male, aged 23 years. Adenitis in the left crural region for 21 months. No previous treatment. Had had malarial fever. Five injections given, two of 5 grammes, two of 10, and one of 20 grammes of iodide of sodium. Cure in 10 days. Gain in weight ·98 kilo.

The author believes that this system of injections of iodide of sodium, due to KLEMPERER, constitutes a veritable specific for tropical bubo. J. B. N.

EMILY (J.). **Adénites tropicales.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 611–620.

The author calls attention to the frequency and severity of cases of adenitis treated in hospitals in the colonies, and the long time taken to cure them. He discusses at some length this frequency and the tendency there is to suppuration. He limits his remarks to inflammations in the groin as being most frequently observed and requiring most often intervention. He considers the regions drained by the lymphatics of this region and points out that erosions and ulcerations of the skin are more frequent in the tropics than in temperate regions. Moreover, the intestinal mucous membranes are more subject to ulceration, and affections of the liver lead more often to haemorroids which easily become ulcerated. One must consider, he adds, not only the seed but the soil. The more severe forms are seen in debilitated subjects, and he asks whether every European who is transplanted to the tropics cannot be so described. He mentions also such depressing conditions as defective diet, faulty hygiene, over-work, etc. He points out that the average stay in hospital for such patients is at least two months.

In order to shorten this period and obtain a more rapid cure he introduces into these gland tumours iodoformed ether. When a patient comes to consult Emily he puts him in hospital, the affected part is shaved and the most prominent part is marked out; this is touched with tincture of iodine and punctured with a Pravaz syringe containing a small quantity of iodoformed ether (5 per cent.). Three or four drops are introduced into the middle of the gland, never more; a sharp pain is experienced which, however, soon disappears. After four or five days, sometimes earlier, the tumour begins to diminish and the fever falls. In a week or more the gland is scarcely perceptible and quite painless. If the tumour is composed of several glands, the puncture is made into the one which occupies the centre. On two occasions fluctuation was already established; in these cases also a good result was obtained. In one instance the patient was mobilised and had to be treated as an outpatient; the result was equally good. The author always employs other measures. The patient is kept in bed and has damp compresses with, for the night, friction with mercurial cream. At the same time he receives subcutaneous injections of cacodylate of soda, and iodide of potassium at his two chief meals. Single injections have always sufficed for cure except in two cases when two were given at some days' interval. Details are given of nine cases, three of which were furnished by the author's colleague, KERNEIS. The accounts given bear out what has been said above. A. G. B.

VIVIÉ. **Eléphantiasis de la verge et du scrotum consécutif à l'extirpation bilatérale totale des ganglions inguinaux.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1915. Apr. Vol. 6. No. 4. pp. 151–154. With 2 figs.

The patient was a Frenchman, aged 39, who had been in Indochina ten years, and had never been ill. In October 1912 he had double adenitis of his inguinal glands of venereal origin and entered hospital, where the glands were completely removed. He left in February 1913 with a normal scar. Twenty days later there appeared on his right

thigh a red plaque, 10 cm. in diameter, raised and very painful; this disappeared and reappeared in another situation, a month later disappearing completely. Then began periodical swellings first of the prepuce, then the penis and finally the scrotum. This went on through 1913 without fever and without pain. From January 1914 the increase was continuous with attacks of fever and redness of skin. In December 1914 he entered hospital again, when there was found to be a moderate elephantiasis of the penis and scrotum, the organs remaining separate. The scrotum was as large as an adult's head. Examination of the blood taken on several occasions at midnight near the tumour did not reveal microfilariae. The operation which was performed is described with a figure.

The author concludes that the elephantiasis was the result of the radical operation on the glands on both sides. He thinks that such an operation should not be done, and points out that mechanical obliteration of the lymphatic trunks coming from a given region may produce a lymphangiectasis of that region having the classical features of elephantiasis, which would support the theory that such obliteration was the cause.

[Total extirpation of the inguinal glands has been recognised as a cause of elephantiasis. See, for instance, this *Bulletin*, Vol. 1, p. 93–4.]

A. G. B.

MAYNARD (G. D.). **Pneumonia Inoculation Experiment No. III.**—*Med. Jl. S. Africa.* 1915. Sept. Vol. 11. No. 2. pp. 36–38.

The author, who is Statistician to the South African Institute for Medical Research, states that at a meeting of the Mine Medical Officers held in March, 1914, it was recommended that "for the space of three months every other native passing through the Government and Witwatersrand Native Labour Association compounds should be inoculated with a polyvalent pneumococcal vaccine, both groups, inoculated and uninoculated, being kept under observation." The experiment was organised on behalf of the Chamber of Mines by the South African Institute for Medical Research. Reasons are given why previous experiments had been unsatisfactory. The polyvalent vaccine contained definite proportions of known Rand strains. The experiment commenced in July and lasted four months, a total of 55,900 natives coming in, 12,400 being East Coast natives, the remainder from Cape Colony and other parts of the Union.

Over a period of ten months there were 1,035 recorded cases of pneumonia, with 139 deaths distributed as follows:—

TABLE I.

	Cases.	Deaths.	Case Rate* per 1,000.	Death Rate* per 1,000.	Case Mortality.
Uninoculated ..	576	78	20·6	2·8	13·5
Inoculated ..	459	61	16·4	2·2	13·3
Total ..	1,035	139	18·5	2·5	13·4

*N.B.—These are not rates per annum.

The table on page 325 gives the attack rates in 28 day periods after the date of inoculation.

It is clear, the author writes, that there is no significant gain to the inoculated after the end of the fifth period.

"Summarising the results of the previous enquiry, we wrote :—

"'(1) That the attack-rate from pneumonia is apparently lessened by inoculation, a small positive correlation being obtained.' The present enquiry confirms this finding.

"'(2) That the beneficial results observed are most marked during the first month after inoculation, and that they gradually diminish until at about the end of the fourth month, no protective power apparently remains.' In this experiment the protective value does not appear to last for more than five months at most. . . .

"'(3) That there is little or no evidence that the case mortality is favourably affected by inoculation.' The present experiment confirms this. . . .

"Considering the evidence obtained from all the experiments conducted on the Rand, I think the following statements are justified :—

"(1) That anti-pneumonia vaccination may be expected to reduce the incidence of pneumonia for a four or five month period. After this period no reduction in the attack-rate can be anticipated.

"(2) That we have no satisfactory evidence at present as to whether two or more inoculations will increase the value of the process, either in regard to reduction in the attack-rate, or length of period for which it is effective."

A. G. B.

SITSEN (A. E.). **Waarom verloopt de croupeuze pneumonie in Indië zoo atypisch?** [Why does Croupous Pneumonia run such an Atypical Course in the Indies?]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 5. pp. 533-549.

The author asks why croupous pneumonia in the tropics so often runs an atypical course. Out of 42 consecutive post-mortem examinations of cases of pneumonia, made in Batavia, 24 only exhibited the characteristic red hepatization of the lung. In tropical pneumonia the lung appears to be unable to exude the usual amount of fibrin, so that the affected lobes collapse more or less when the chest is opened, even when carnified; and in a considerable proportion of the cases examined the diagnosis could not be made during life, from the absence of physical symptoms. This state of things the author attributes primarily to concomitant disease of the spleen, due to malaria, and he gives a table showing the spleen weights of the 42 cases examined, in comparison with the condition of lung found. The larger the spleen, the less frank the type of pneumonia.

J. B. N.

MEYER (K. F.). i. **Epizootic Lymphangitis and Sporotrichosis. (Studies on American Sporotrichosis II.).**—*Amer. Jl. Trop Dis. & Prevent. Med.* 1915. Sept. Vol. 3. No. 3. pp. 144–163.

ii. **The Relation of Animal to Human Sporotrichosis. Studies on American Sporotrichosis III.**—*Jl. Amer. Med. Assoc.* 1915. Aug. 14. Vol. 65. No. 7. pp. 579–585.

i. In the first of these two communications the subjects of epizootic lymphangitis and sporotrichosis are considered in some detail, especially the question whether the parasite of the former disease should be

[MAYNARD (G. D.).]

TABLE II.

Days	28	56	84	112	140	168	196	224	252	280	308	Total.
Uninoculated	119	120	83	86	57	42	38	20	9	2	0	576
Inoculated	97	90	60	56	43	46	40	15	7	4	1	459
Total	216	210	143	142	100	88	78	35	16	6	1	1035
Gain for Inoculated ..	22	30	23	30	14	–4	–2	5	2	–2	–1	117

assigned to the Protozoa or Blastomyces. The author decides in favour of the Blastomyces on the grounds that the staining reactions show that the granule which resembles the blepharoplast of leishmania is *metachromatic* and *not nuclear* material; that staining by Gram is always positive, whereas in the case of protozoa it is negative; that the intracellular position of the parasite is shown to be a phenomenon of phagocytosis, and not the expression of intracellular habitat. He bases this conclusion also on the structure of the parasite. The respects in which epizootic lymphangitis and sporotrichosis differ are set out in detail. The following are the conclusions:—

"Epizootic lymphangitis of equines is caused in South Africa, Algeria and Jamaica by a parasite which morphologically (Gram positive, irregular inside-structure, budding forms) has all the characteristics of a yeast and which biologically behaves, in the complement fixation test, like a blastomyces. The similarity with Leishmania bodies, which is suggested by some staining reactions (with Giemsa, etc.) and the position of the parasites in the phagocytes, is explained, and it is demonstrated that the serologic tests and the more careful morphological studies with hematoxylin stains do not justify the creation of a new species of lymphosporidium (Gasparini, 1908). The parasite is not a protozoon but a blastomyces, namely: the *Cryptococcus farciminosus.*

"In the United States the disease which was diagnosed as epizootic lymphangitis in 1907, has been recognised as being sporotrichosis. Epizootic lymphangitis apparently does not exist here. Morphologically, by cultures and serum tests, the two diseases can easily be separated. In horses the parasite of sporotrichosis is very rare in the pus and can rarely be demonstrated microscopically.

"The sera from sporotrichotic infections give complement fixation with the *Cryptococcus farciminosus,* indicating a relation of the *Sporothrix Schencki-Beurmanni* to the cryptococcus. This observation is further proof of the vegetable nature of the parasite of epizootic lymphangitis.

"Human infections from equine sources of epizootic lymphangitis and sporotrichosis are rare. It is in the interest of Comparative Tropical Medicine that suspected cases of infections of epizootic lymphangitis should, in future, be carefully investigated bacteriologically and serologically."

ii. The author himself became infected in the laboratory with sporotrichosis when he was working with an equine strain. He gives the history of his infection, which was cured by iodine treatment. Other laboratory infections are quoted from De Beurmann and Gougerot's work.

Conclusions. "Spontaneous sporotrichosis of domesticated animals particularly horses, is very common in certain parts of the United States.

"Extensive bacteriologic, serologic experiments have proved the identity of the causative organisms in human and animal sporotrichosis. The pathogenicity for human beings was observed in an accidental laboratory infection.

"The geographic distribution of equine sporotrichosis, which is apparently closely connected with certain telluric and climatic conditions, covers, in two states, the same territories from which numerous cases of human infection have been reported in the last five years. In Pennsylvania, equine sporotrichosis—as so-called "epizootic lymphangitis"—has been noted in as many as 150 cases annually.

"Only two human cases are on record in that state. A careful study of one case suggested at first a contact infection with a sporotrichotic horse, but this assumption could not be proved conclusively. The evidence collected does not support the theory that human sporotrichosis is very frequently transmitted from horse to man in the United States. The

cases of Hyde and Davis, Sutton and others are discussed from this point of view, and compared with the cases reported by Gougerot, Carougeau, Lutz and Splendore, and Rouslacroix.

"The absence of sporotrichosis among veterinarians and farmers in Pennsylvania—where equine sporotrichosis is so exceedingly common and so often treated, calling forth undoubtedly close contact with infectious material—demonstrates that sporotrichotic infections in man are established by this channel of contact in rare instances only."

A. G. B.

PIETROFORTE (Vincenzo). **Sulle alterazioni del sangue nella scorbuto osservato in indigeni detenuti nelle prigioni di Assab.** [On the Alterations in the Blood of Scurvy, observed in Natives confined in the Prisons at Assab].—*Ann. Med. Navale e Colon.* 1915. Ann. 21. Vol. 2. No. 4. pp. 277–288.

Some rather brief and insufficient notes by a naval surgeon, taken during a flying visit to a penal colony at Assab in the Italian dependency of Erytrea on the Red Sea. About 20 of the native prisoners in a gaol at this place showed signs of scurvy in the shape of swollen and bleeding gums, articular swellings in the knees, and hardness of the muscles of the calves, due probably to interstitial haemorrhages. The condition had lasted in some of the cases for nearly two years, and apparently had been diagnosed as beriberi by those in charge of the prisoners, but the symptoms receded promptly when lemon-juice was administered, whether on the advice of the author or not, he does not say. There was nothing in the diet of the prisoners to account for symptoms of either beriberi or scurvy, but the life of the prisoners was indolent in the extreme, for want of occupation. The author made some estimations of the amount of haemoglobin in the blood of twelve of the patients, and obtained some blood counts from them afterwards through the agency of the prison surgeon. He also made some films, which were stained on his return to Italy. The general result of the observations was to show a largely reduced number of red cells per cubic millimetre, with a high haemoglobin value per cell, a reduction in the proportion of leucocytes, and a great tendency in the red cells to take up the basic dye of Giemsa and Romanowsky stains, so as to render them of a deep violet colour. The conditions under which these observations were made were evidently not favourable to a perfect result.

J. B. N.

NICHOLLS (Lucius). **An Epidemic of Acute Hydrocele and Orchitis in British East Africa.**—*Lancet.* 1915. Aug. 21. pp. 384–385.

The patients were African porters who had been recruited in the island of Zanzibar and were attached to the Carrier Corps of the East African Forces. On December 19th, 1914, eight porters suffering from this condition were admitted to the base hospital and on the next day another four. Three cases are described illustrating three degrees of severity.

Case 1. The scrotum was greatly enlarged, more so on the right side; the subcutaneous tissue was oedematous; the patient complained of much pain. A trocar was inserted on the right side and 9 oz. of turbid blood-red fluid were drawn off. From the left side 6 oz. of turbid fluid

were withdrawn. It was then found that the right testicle was enlarged, indurated and tender. The epididymis was undoubtedly implicated. The spermatic cord was not thickened nor tender. The patient was very ill; the temperature ranged from 100·5° in the morning to 103° at night. The right hydrocele filled up again and the patient complained of increased pain. A week after admission he was chloroformed and an incision made which gave exit to 8 oz. of semi-purulent fluid from the hydrocele. An incision into the testicle let out creamy pus. The testicle and epididymis were completely disorganised and were removed. The patient made a good recovery.

Case 2 was less severe. Here again an operation was done. A small incision was made into the testicle and some turbid blood-stained fluid exuded. The enlargement of the testicle slowly subsided but the organ remained indurated and larger than natural.

Of the twelve patients two were severely ill, as in Case 1, and one testicle was removed in each case. Three cases showed similar severity to Case 2. The remainder could be placed in the same class as Case 3. Out of the original 400, 348 porters were now examined and hydroceles were found in 38; in 10 there were signs of inflammation in one or other testicle. Thus of these porters 13.8 per cent. had hydroceles and 6·1 per cent. orchitis. Care was taken to exclude venereal disease.

In smears made from slides from the fluid of the patient in Case 1 streptococci were found in long chains and arranged in pairs. By Gram the streptococci were less easily decolourised than *B. typhosus*, but did not retain the stain so retentively as staphylococci. From 9 of the 12 patients streptococci were grown of the same morphological appearance and giving the same tests. The author concludes that this streptococcus was the organism which caused the orchitis. The blood of 12 patients in hospital and 16 others who had hydroceles was examined.

"In 16 of these 28 cases microfilariae nocturnae were found. The conclusion is that filarial infection had caused the chronic hydroceles, and this prior infection had rendered the tissues of the patient liable to the attacks of other organisms, and the (diplo)-streptococcus, finding a favourable soil, had produced an epidemic of acute hydrocele and orchitis."

The author notes that the disease called endemic funiculitis is caused by a similar diplo-streptococcus. A. G. B.

Breinl (A.) & Priestley (H.). **Note on "Boomerang Leg." A Bone Disease occurring amongst Australian Aboriginals.**—*Jl. Trop. Med. & Hyg.* 1915. Oct. 1. Vol. 18. No. 19. pp. 217–218. With 1 plate.

Ernest Black, as quoted by Castellani and Chalmers, has drawn attention to a disease occurring among natives in Western Australia, the Northern Territories and the Torres Straits Islands, characterised by a bowing forward of the bones of the legs. The authors have observed such cases amongst the natives of North Queensland and the western parts of British New Guinea. The disease affects young natives of both sexes and the resulting deformity persists throughout life. In every case both legs were affected.

"The onset seems to be gradual; the children complain at first of pains in the shins, sufficiently severe to prevent them from walking. The skin over the tibia is tender to pressure, but there is no swelling noticeable. These pains become less severe in the course of time, the children begin to use their legs again, and the tibiae and fibulae bend forward gradually and assume the characteristic shape. In consequence of this the centre

of gravity of the body is displaced forward, the patient becomes flat-footed, and the gait shuffling. The deformed bones gradually increase in thickness, but retain their altered shape."

The authors were able to obtain an X-ray photograph of the leg of an affected Queensland aboriginal and the bones after death. These form the subject of the illustration. Both tibiae and fibulae were markedly curved with the convexity forward. A longitudinal section through the middle of the tibia showed that the compact substance was greatly increased in thickness over the greater part of the shaft and slightly decreased at both extremities. It was much denser in structure than normal and was of ivory-like appearance. The history of the disease and the appearance of the bone suggested that Boomerang leg is the result of a chronic osteomyelitis of both tibiae, taking at first the form of a rarifying osteitis, which is followed later by a condensing osteitis. The etiology is unknown but syphilis and tuberculosis can be excluded. A. G. B.

Van den Branden (F.). **Réaction méningée de la syphilis chez un Noir du Congo.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 570–571.

A note from Leopoldville. A native was treated in January 1915 for a specific chancre by neosalvarsan (two 0·75 gm. injections). Four months later he returned emaciated, with difficulty in walking, intense headache and insomnia. Lumbar puncture gave a clear fluid containing 35 lymphocytes per cmm. The blood centrifuged on three occasions was negative for trypanosomes. He was treated with seven injections of grey oil and pot. iod. daily for two months. He improved progressively and in August his cerebro-spinal fluid was normal. The author has met with other similar cases. A. G. B.

Cook (Jerome E.) & Meyer (Jerome). **Severe Anaemia with Remarkable Elongated and Sickle-shaped Red Blood Cells and Chronic Leg Ulcers.**—*Arch. Intern. Med.* 1915. Oct. 15. Vol. 16. No. 4. pp. 644–651.

The authors' case was that of a mulatto woman, æt. 21, who was born in S. Louis and had always lived there. The ulcer (a recurrence) just above the internal malleolus had existed ten months before she entered hospital, and soon healed there. The most striking feature in the blood preparations, both fresh and stained, was the shape of the red cells. "About one in three was elongated, oat-shaped or crescent-shaped. Some of the crescent-shaped cells in the fresh drop would curl and bend as if they were unusually pliable. . . . Nucleated reds were always present." The following counts are, the authors say, selected from a large number.

Cell Count and Haemoglobin.

Date.	Red Blood Cells.	White Blood Cells.	Haemoglobin. %
11/3/14	2,008,000	10,560	43
11/10/14	2,240,000	10,320	45
1/14/15	2,960,000	14,200	53

Differential Counts.

Date.	No. of cells counted.	Normoblasts.	Intermediates.	Lymphocyte. %	Large mononuclear. %	Polymorphonuclear. %	Eosinophil. %	Basophil. %
11/ 5/14	1,000	21	11	17·8	10·6	58·4	12·6	0·6
11/14/14	200	4	1	30·5	3	37·5	26	3
1/10/15	200	8	..	23	8	55	12	2

The eosinophilia was very variable. No parasites could be found in the blood or stools. There is the possibility of an inherited anomaly. Similar cases, abstracts of which are given in the paper, have been reported by WASHBURN and HERRICK. Of these cases and their own the authors write :—

"All three of the patients were of negro blood ; all three suffered from peculiar, indolent, recurring leg ulcer ; in all three the anaemia was sufficiently severe to cause dyspnea on exertion, and in all of the cases there was a peculiar discoloration of the sclerae, which in our case and that of Washburn is described as a "greenish tinge" and which Herrick notes as "a tinge of yellow" ; in no case could enlargement of the spleen be made out ; responsibility for the condition could not be placed on syphilis or a parasite, although a careful examination was made in each case for such a possible etiological factor.

"The uniformity of the blood abnormality is even more striking, the individual differences being of degree rather than of kind and depending no doubt to some extent upon the time at which observations were made.

"The red cells in the three cases, in the numerous examinations made, varied between 1,800,000 and 3,000,000 with a striking tendency to remain around 2,500,000. In all of these cases there was a leukocytosis of more or less marked degree, and in all cases there was an eosinophilia of distinct but varying degree. A varying number of nucleated red cells was present in all cases, in no case were they rare or difficult to find. A glance at the blood slides leaves no doubt as to the identical character of the elongated and sickle-shaped red cells. The percentage of these cells was greater in our case than in the other two, but even in these it was considerable."

The anomalous cells are well shown in two photomicrographs.

A. G. B.

BRUNTON (Lauder). **Treatment of Scorpion Stings.** [Correspondence.] —*Lancet.* 1915. July 24. pp. 200–201.

MACKENZIE (A. J.)—*Ibid.* Oct. 2. p. 781.

KING (W. G.).—*Ibid.* Oct. 9. pp. 835–836.

Sir Lauder Brunton thinks that permanganate of potash in his snake lancet would be useful for scorpion stings as well as snake bites. He writes that the lancets can be obtained for 2½*d.*, less for quantities, from Messrs. Wm. Mitchell (Pens) Limited, 8, Warwick Lane, London, E.C.

A. J. Mackenzie writes from Hartley, Rhodesia, that proximal ligature and immediate scarification round the sting, followed by the rubbing in of permanganate of potash, gives the greatest relief. Stings from hornets can be similarly treated.

Colonel King used the permanganate method prior to 1886, on dozens of cases—proximal ligature, incision through the point of puncture, squeezing of the wound, and insertion of the permanganate. If the affected part were on a limb, it was soaked in strong and warm permanganate. He points out that the action of the scorpion virus varies greatly in different individuals.

[The permanganate treatment is that recommended by CASTELLANI and CHALMERS.]

A. G. B.

ROEMER (R.). **Die Gicht als Tropenkrankheit.** [Gout as a Disease of the Tropics.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. Sept. Vol. 19. No. 18. pp. 490–497; Oct. No. 20. pp. 529–554.

In the author's opinion "arthritis urica" or gout has greater importance in tropical pathology than is usually believed. Most of the text books of tropical medicine make no reference to it. [In the manuals of MANSON, and CASTELLANI and CHALMERS, the word gout is not found in the index.] The tropical practitioner, the author thinks, meets with the preliminary stages rather than the joint symptoms. Inflammation of the periosteum and tendon sheaths, muscular pains, neuralgia are often treated as rheumatic or syphilitic when they should be attributed to gout. These and a complex of symptoms such as dyspepsia, changes of disposition, languor, cramps in the calves, stiffness, migraine, are met with not only in the European, especially those who have returned to Europe, but also in the natives. [The author writes apparently of the Dutch East Indian Archipelago.] Seborrhaea of the face, nose, or hairy scalp and fine venous varicosities on the cheeks and nose of persons in the tropics betoken, in the author's view, latent gout. He admits that tropical climate has no influence on metabolism of purins. The views of physicians on the nature of gout from GALEN to GARROD are then considered. There follows a discussion of the foods rich and poor respectively in purins, with tables, and sample diets.

A. G. B.

SEHEULT (R.). **Three Cases of Gall-Stones, with Remarks on the Rarity of the Condition in Trinidad, B.W.I.**—*Practitioner.* 1915. Nov. Vol. 95. No. 5. No. 569. pp. 707–715.

Notes are given of three cases of gall-stones which occurred in the author's practice at Port-of-Spain, Trinidad. After a discussion of these cases the author remarks that he has searched the medical and surgical records of the Colonial Hospital, Port-of-Spain and has not been able to collect more than eleven cases of gall-stones among 64,126 admissions during the decade 1904–1914. In 7,557 autopsies gall-stones were found in only five subjects. Allowing for faulty diagnosis and incomplete post mortem records it would appear that gall-stones occur very rarely in Trinidad. The author considers that the diet of the population, one-third of whom are East Indians, rather supports the view that food poor in albumen tends to diminish the incidence of gall-stones.

[Compare the figures obtained by CLARK (this *Bulletin*, Vol. 6, pp. 424–5. The figure given as 4,088 in the last line of page 424 should be 1,088). Of 1,598 young West Indians autopsied in the Panama Canal Zone 49 contained gall-stones, i.e., about 3 per cent., as against ·06 per cent. in Scheult's figures.]

A. G. B.

FOY (H. Andrew). **Inoculation of Small-pox as a Prophylactic Measure as practised by the Natives at Djen in Nigeria.**—*Jl. Trop. Med. & Hyg.* 1915. Nov. 15. Vol. 18. No. 22. pp. 255–257.

Djen is a large pagan settlement on the right bank of the Benue river in the Northern Provinces of Nigeria. The population is 4,700; males 1,200, females 1,500, and children 2,000. When the author arrived small-pox had been prevalent for five months, and 300 were said to have died. In the chief's section there were 84 persons, of whom four had contracted the disease. The rest were inoculated nine days before Foy reached the scene. He describes the process of inoculation. The lymph is taken on the ninth day from the pustules of a case of discrete small-pox in a young person. The results are summed up in the table on page 333.

The author draws attention to the fact that children show a greater susceptibility to the disease when inoculated than do adults. The mortality of the 26 cases that developed small-pox was nil, but mortality occurred among other inoculated cases. The incubation period in the naturally acquired disease is eleven days; in three inoculated cases it was seven.

"Of the twenty-six cases that developed small-pox six were badly marked, showing a fairly acute attack of discrete small-pox; the remaining twenty had slight marking as an indication of a mild attack."

The author refers to the use of salol in treatment in the following words:—

"If treatment by salol, 10 gr., three times a day, is begun within the first two or three days after the eruption appears it has the remarkable effect of lowering the temperature, the intensity of the suppurative phase is much modified, the pitting is much less marked, and the recovery is comparatively rapid. Carbolic oil (1 in 40) is applied daily to the eruption on the skin."

A. G. B.

PIETRI (Giovanni Andrea). **Contributo clinico allo studio del cosidetto fegato infettivo acuto.** [A Contribution to the Study of the So-Called Acute Infective Liver.]—*Policlinico.* Sez prat. 1915. Oct. 31. Vol. 22. No. 44. pp. 1469–1474.

The condition here described has nothing to do with tropical disease, properly speaking. TALMA, BOZZOLO, REMLINGER, SCHULTZE and others have already defined it under the names of benign parenchymatous hepatitis, acute infective liver, acute curable hepatitis and so on. It appears to differ principally from ordinary pylephlebitis by the non-fatal issue, so that the diagnosis always remains more or less in doubt. The patient whose case is recorded was a man who was kicked by a bullock in the left inguinal region. Signs of peritoneal injury followed, and the health became impaired. The symptoms

[Foy (H. A.).]

Statistics of the Results of Inoculation with Small-pox as a Prophylactic Measure carried out by the Natives at Djen, on the Benue, in Nigeria, West Africa.

Total Population in the Serikis Ungwa at Djen.				Local Reaction seen on the ninth day after inoculation.					
Sex.	Number.	Number had small-pox or previously inoculated.	Number inoculated with small-pox.	Local reaction.	Local reaction *nil.*	Percentage of inoculated that developed a local reaction.	Total number of those inoculated that developed small-pox.	Percentage of those inoculated that developed small-pox.	Percentage of those with local reaction after inoculation that developed small-pox.
Males	14	7	7	6	1	85·7	2	28·5	33·3
Females.. ..	24	12	12	9	3	75·0	4	33·3	44·4
Children ..	42	1	41	34	7	83·0	20	48·7	58·8
Total	80	20	60	49	11	81·5	26	43·3	53·0

complained of consisted in fever of a hectic type with headache, vomiting, disturbance of digestion and pain in the hepatic and hypochondrial regions with extension to the right shoulder. In the belief that the patient might be suffering from liver abscess or hydatid, the liver was explored through the usual transpleural incisions, but neither pus nor hydatid could be found. After the operation the patient began to improve and finally got quite well. A bibliography of papers bearing on the subject is appended.

J. B. N.

GUNSON (E. B.) & GUNN (J. W. C.). **An Epidemic of Jaundice occurring at Alexandria.**—*Lancet.* 1915. Dec. 11. pp. 1294–1295.

During June, July and August, 1915, the authors, Lieutenants in the R.A.M.C., treated "a large number" of cases of jaundice, all without exception being from a single camp. They give an account of the symptoms, from which the following is taken:—

"The liver was invariably enlarged, sometimes extending as much as 3½ inches below the costal margin; . . . there was marked tenderness. The spleen was similarly greatly enlarged, frequently extending upwards to the seventh rib in the posterior axillary line, one or two inches below the costal margin, and sometimes reaching as far forwards as the nipple line, splenic and liver dullnesses not infrequently merged one into the other. The spleen was tender, and pain in this region was a common symptom.

"The heart presented a very striking degree of enlargement in practically all cases. This enlargement was so definite and so persistent, associated as it was with giddiness and dyspnoea on exertion, as to make it almost the leading feature in the clinical picture. Cardiac dullness was almost constantly increased to the right, the right border of the heart frequently extending 2 inches, and in one case 2½ inches, to the right of the midsternal line. The cardiac impulse was frequently palpable to the right of the sternum. The apex beat remained internal to the left nipple line, the increase in the size of the heart apparently affecting the right side only. . . . The increase in the size of the heart, the liver, and the spleen was frequently confirmed by X-ray examination."

The urine did not contain albumin. Most of the patients remained under observation from three to four weeks, when they were sent to England.

"In all patients marked general weakness persisted, and the majority were unable, after having been out of bed for two or three weeks, to perform even moderate exercise, such as walking upstairs, without inducing dyspnoea and giddiness, which were accompanied by marked increase in the pulse-rate; there was no praecordial pain. Some enlargement of the heart persisted in practically all cases, and was not reduced by rest."

Various drugs were tried, but appeared to be without influence on the course of the disease. There were no deaths. D. THOMSON is said to have made a report on the blood, but it is not reproduced.

A. G. B.

KNAPP (H. H. G.). **"Morphine Injector's Septicaemia" ("Whitmore's Disease").**—*Indian Med. Gaz.* 1915. Aug. Vol. 50. No. 8. pp. 287–288.

In 1912 Major WHITMORE, I.M.S., described the pathological anatomy and etiology of a disease that is met with fairly frequently in Rangoon. He called it "Morphine Injector's Septicaemia." The

author thinks it may be met with elsewhere in India. He gives an account of a case in a Burman who was admitted to gaol in apparently good health. Five months later he was taken ill with cough and fever. The base of the left lung was dull with loss of breath-sounds and diminished fremitus. A diagnosis of chronic tubercular pleurisy was made. After an illness of about 12 weeks with irregular fever he died. The lungs were found to contain "numerous areas of a grey yellow colour, of fairly firm consistency, irregular in outline, varying in size from two or three lines to half an inch across." There were small abscesses in the spleen and liver. From the lungs and spleen a motile bacillus was isolated which gave the cultural characters of that described by WHITMORE [see this *Bulletin*, Vol. 1, p. 588].

Since 1910 eleven instances of this disease have been met with in the Rangoon Gaol. It occurs in adult males of the poorer class. In nine cases the patient was an habitual morphine injector. General malaise and fever are early symptoms. The duration is for three months with pulmonary signs and symptoms. The lesions are highly characteristic and consist of the nodules in the lungs already described; they resemble areas of bronchopneumonia. Similar nodules were seen in the liver in three instances and in the kidney in one. There is a general similarity between this disease and glanders, both with regard to the symptoms and the pathology. It has however no relation to the horse, but has a very close relation to the hypodermic syringe. There are no skin lesions.

A. G. B.

McCOMBIE. **An Outbreak of Anthrax.**—*Indian Med. Gaz.* 1915. Aug. Vol. 50. No. 8. pp. 288–291.

The paper deals with two outbreaks, in 1901 and 1914 respectively, on the same garden in Assam, both associated with an anthrax epidemic among the cattle. There were 57 cases with 13 deaths, or 25·4 per cent.; nine were cases of internal anthrax, all of which died, leaving 42 cases of malignant pustule, of which four died. There was no doubt of the association with the cattle epidemic. In most cases the fact was established of either cutting up or eating cattle dead of the disease. An instance is given, however, to show that it by no means follows that eating anthrax cows will be followed by anthrax in the coolie. The author describes his cases of malignant pustule and then goes on to those of internal anthrax. Some cases of this form died quite suddenly in the lines; the only history one obtained in many instances was that they had been feeling ill the day before and got fever during the night and died. McCombie says there is nothing distinctive about the symptoms of these cases, which are very puzzling. One suggested acute obstruction. As a rule the bacilli are easily found in the blood. The post mortem always clears up the diagnosis.

The author treated his malignant pustule cases by the injection of 50 per cent. carbolic acid all round the pustule. He says he has not lost a case in which this has been done properly. The treatment of the internal cases is hopeless. He gives a few elementary facts about the disease in horses and cattle, and states that the most important preventive measure on a garden is to get early intimation of cattle deaths to prevent coolies getting the meat for consumption.

A. G. B.

BREINL (A.) & PRIESTLEY (H.). **Differential Counts and the Neutrophile Blood Picture of Natives—Adults and Children of New Guinea.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 495–505.

The material was collected during a journey through the coastal parts of British New Guinea, blood films being made from apparently healthy natives of different ages. All films containing microfilariae or malarial parasites were discarded. From adults 104 films were examined and from children, apparently below 10 years of age, 50. For the differential counts 500 successive leucocytes were enumerated. The average figure for the polymorphonuclear leucocytes in adults was 51·06 per cent., maximum 81, minimum 28·9, which is somewhat below the normal European average. The average number of lymphocytes was 32·1 per cent.; an observation which agrees with those of previous investigators, who have found that the relative number of lymphocytes in the blood of native races in the tropics is definitely increased. The average number of eosinophiles was 11·97, maximum 31, minimum 0·4. The differential counts of 50 children showed similar but more pronounced changes. The average Arneth index in the adults was 74, practically the same as that in North Queensland school children. The average index in the children was 83·86 per cent.

The conclusions are as follows:—

"1. Differential counts on 104 adult natives of New Guinea show a decrease in the number of neutrophile leucocytes and an increase in the number of lymphocytes and eosinophiles.

"2. Differential counts of 50 native children show similar but more pronounced changes.

"3. Arneth counts of adult natives show a marked shift to the left, the average Arneth index being 74·0.

"4. Arneth counts of 50 children gave an average Arneth index of 83·86.

"5. The identity of the Arneth index of adult natives with that of healthy school children in North Queensland strengthens the assumption that climatic influences, *per se*, cause a 'shift to the left'; but the still greater shift in native children is probably due to active or latent infections."

A. G. B.

MACFIE (J. W. Scott). **Nuclear Variations of the Neutrophile Leucocytes (Arneth Counts) in Malaria and Yellow Fever.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 435–456. With 4 charts.

The author writes that in considering the significance of a shift to the left of the Arneth count, such as is found in Europeans in the tropics, it is important to determine in the first instance the effect on the polymorphonuclear leucocytes of the diseases prevalent in these climates, and especially malaria. He examined 29 apparently healthy Europeans in the Gold Coast and found the average Arneth index to be 51·6, maximum 75, minimum 32·5; that is, there was a slight shift to the left, such as was found by CHAMBERLAIN and VEDDER in healthy American soldiers in the Philippine service. Practically all had suffered from malarial fever at some time and the author believes that this is a sufficient explanation of the left shift. He notes that some

showed a normal Arneth count after more than a year's residence in West Africa. Arneth counts were then made in the case of 20 apparently healthy natives at Accra. The average index was 55·9, maximum 98·5, minimum 55·9, again a slight shift to the left. He believes that in this case also the shift is to be accounted for by malaria and possibly other diseases.

Malarial Fever.—He refers to his previous paper [this *Bulletin*, Vol. 6, p. 345] and to that by KNAPP [*loc. cit.*]. He has made counts in 44 cases of proved or suspected malarial fever. In 23 cases in which malarial parasites were found, 10 being Europeans and 11 natives, in each case there was a very marked shift to the left, maximum 97·5, minimum 74, average 86·6. The index was rather higher in the natives than in the Europeans. In nine cases, all Europeans but one, in which there was only presumptive evidence of malaria, the index averaged 79·3. In 12 other cases of fever suspected of being malarial there was again a shift to the left, the index being 71·35. The complete figures are in each case given in tables. In severe cases the majority of the polymorphonuclear leucocytes were of the types included in Class I, especially forms with simple horse-shoe shaped nuclei. The author notes that this effect is observable before the onset of the attack of malaria and gives an example. The shift may persist for a considerable time after the attack is apparently cured, as is shown in Table VI.

TABLE VI.—Successive Arneth counts in a severe case of malarial fever in a native.

Date.	Clinical Condition.	Arneth Classification per cent.					Arneth Index.
		I.	II.	III.	IV.	V.	
1/14/15	*P. falciparum*, 1 to 400 R. B. C.	67·0	25·0	8·0	—	—	92·0
1/15/15	*P. falciparum*, 1 to 713 R. B. C.	46·0	43·0	11·0	—	—	89·0
1/25/15	Well	27·5	47·0	22·0	3·5	—	74·5
2/9/15	Well	20·0	42·5	34·5	3·0	—	62·5
2/24/15	Well	18·5	43·5	34·0	4·0	—	62·0

Yellow Fever.—The author made his counts on a series of blood films collected by Dr. J. M. O'BRIEN from cases of yellow fever at Guayaquil [this *Bulletin*, Vol. 5, p. 76.] They were taken on thirty-five days from 17 cases of yellow fever. The author considers here the films which were made on the first days and observes there was a profound shift to the left, more pronounced than in malaria. The index was 90·5, maximum 99 (3 cases), minimum 72·5. He thinks that the occurrence of a very high Arneth index in a suspicious case of fever in which no malarial parasites could be found would be strongly in favour of a diagnosis of yellow fever, especially as in cases of obscure malaria the index is less high than in pronounced cases of malaria. The difference is shown graphically in charts.

He proceeds to discuss the significance of the changes observed and refers to the view of ARNETH, CHAMBERLAIN, and BREINL and PRIESTLEY. [See also page 298.]

The summary is as follows :—

"1. A slight shift to the left of the Arneth count is found in the blood of healthy Europeans in West Africa.

"2. There is a marked shift to the left in malarial fever which is evident not only during the attack, but also before its onset, and for a considerable time after convalescence is established.

"3. It is probable that the abortive inoculations with malaria parasites by infected mosquitos, which are a part of the daily life in many parts of West Africa, are sufficient to account for this shift in apparently healthy Europeans, without postulating a specific action of the climate on the white races living in the tropics.

"4. In yellow fever there is a great shift to the left of the Arneth count.

"5. It is suggested that the changes observed in the Arneth counts are due to toxaemia causing a destruction of the circulating polymorphonuclear leucocytes, and a flooding of the blood with young cells liberated by the activity of the leucopoetic system."

A. G. B.

YOUNG (William John). **Observations upon the Body Temperature of Europeans living in the Tropics.**—*Jl. Physiology.* 1915. May 12. Vol. 49. No. 4. pp. 222–232.

The conclusions reached are as follows :—

"1. The temperature of the mouth of Europeans living in the Tropics is often considerably lower than that of the rectum, and this difference is generally much more marked after exercise just as in temperate climates. The temperature of the mouth is thus not reliable as a measure of the body temperature.

"2. During complete rest the rectal temperature did not show any marked variations from the limits of temperature observed in Europe.

"3. A considerable rise in the rectal temperature was produced by slight muscular work, and this was usually maintained for some time after the work had ceased.

"4. The high rectal temperatures observed throughout the day were due solely to muscular exertion."

Alluding to previous observations in the tropics the author says that in most cases the temperatures were taken in the mouth or axilla and only in a few cases in the rectum, most observers having assumed that in a warm and moist atmosphere the temperature of the mouth may be taken as a reliable index of the internal temperature of the body. His figures show however that this is not the case.

The paper contains "observations upon the temperature in the rectum, mouth, and in some cases the urine of six white persons (males) living on the coast of Queensland in latitude 19° 8′ S., the object being to ascertain the daily variations which occur in white people living an ordinary active life in a tropical climate with a high degree of humidity."

HALDANE'S observations, made in mines and Turkish baths, showed that the determining factor in body temperature is the absolute temperature of the wet bulb thermometer. In Townsville, where the observations were made, between November and April the wet bulb thermometer seldom falls below 70° F. in the day time and on many occasions rises above 80°. The subjects of the experiment were the Institute staff, engaged in laboratory occupations. The results are expressed in a series of tables.

After exercise the difference between the mouth and rectum temperature might amount to as much as three degrees. Referring to the work of CHAMBERLAIN [this *Bulletin*, Vol. 3, p. 224], who relied on mouth temperatures, the author thinks it improbable that the figures obtained are of much value as a true indication of the internal temperature of the body, especially those taken immediately after drill. With regard to the upper limit of a normal temperature, fixed by HALDANE as "certainly not below 101°," the author states that this figure was obtained in the rectum of two subjects on several occasions without any special exercise having been performed.

A. G. B.

Book Reviews.

Bruto da Costa (B. F.), Sant'Anna (J. F.), dos Santos (A. C.) & de Araujo Alvares (M. G.). Translated by Wyllie (J. A.), [F. R. G. S.]. **Sleeping Sickness. A Record of Four Years' War against it in the Island of Principe.**—xii + 261 pp. Roy. 8vo. With 75 plates and 3 maps. 1916. London: Baillière, Tindall & Cox. [Price 7*s.* 6*d.* net.]

Readers of this *Bulletin* and its predecessor, the *Sleeping Sickness Bulletin*, are familar with the preventive work which has been done in the Island of Principe from the time of the Correia Mendes Mission, when Maldonado's method of trapping tsetse flies was adopted [*Sleeping Sickness Bulletin*, 1910, Vol. 2, p. 26], to the recent announcement that *G. palpalis* has been exterminated in the Island and with it sleeping sickness [this *Bulletin*, Vol. 6, p. 166].

One must confess to some scepticism as to whether the word extermination is justified, but time will show, for it is improbable that the clearings will be kept up everywhere and, if flies still persist in any part of the island, they will presently multiply and become evident. But even in this case, the Sleeping Sickness Mission in their four years' war have accomplished a great work, on which they are much to be congratulated.

Principe has apparently been the only part of Africa in which the trapping of tsetse has had any marked success. But granted this success, it is not possible for outsiders to tell what part it has really played, for while the fly catching campaign was in progress the estates and their surroundings were being cleared of the vegetation which harboured the flies, and the wild pigs and other possible sources of blood supply were being hunted down.

The present book is a translation of the Portuguese memoir recently published in the *Archivos de Hygiene e Pathologia Exoticas*. It has already been reviewed in this journal [Vol. 6, p. 166] but in its English form merits more detailed notice.

Part I. opens with a history of the epidemic. Following the introduction of the tsetse fly, about 1825, the disease became serious in 1877, and since 1890 has been a "veritable scourge." A table shows that between 1902 and 1913 the average annual mortality from this cause was 5·6 per cent. of the population. The average general mortality in the same period was 15·5 per cent. The average population, all but some 400 being introduced labourers, the so-called serviçaes, was 3,800. An account is given of the two former Portuguese Missions, that of Annibal Bettencourt, which reported in a big volume in 1903, a passing visit only having been paid to this Island, and that of Correia Mendes, 1907–8, which laid the foundation for the work of the present Mission, and of which Dr. Bruto da Costa was a member.

The geography of the Island and the vegetation are discussed at some length. Its total area is 126 square kilometres or 30,720 acres, rather less than the Island of Jersey or about a third of the area of the Isle of Wight. Not more than 40 square kilos, 30 of which are covered with forest, is waste land; the rest is occupied by cacao plantations. The island is of volcanic origin, much broken up into heights and hollows, the highest peaks, in the south, rising to nearly 3,000 feet. There were numerous swamps before the recent operations, aggravated by the clayey nature of the soil. The mean annual temperature is 25·4° C. (77·7° F.), that for the hot and cold seasons respectively being 26·4° and 24·3°; in the south of the island the mean is two degrees less, and the climate is described as temperate. The rainfall is heavy.

The chapter closes with an account of *G. palpalis* in the Island. It is somewhat remarkable that San Thomé, which is only ten hours' steaming from Principe, has not been invaded, though the boats often carry live animals. Before the recent work the fly was ubiquitous in Principe, with the exception of altitudes above 800 feet, the southern portion alone

remaining free. This freedom appears to be due to its mountains and abrupt declivities, which do not favour the stagnation of surface water, and to its exposure to the southerly winds which, from June to September, are dry (*gravana*), or perhaps to the absence of pigs. The wild pigs, with which the flies had an "intimate association," numbered about 5,000. There are no crocodiles nor large lizards and "in various examinations of the stomach contents of glossinas" the authors never found nucleated red cells.

Part II. deals with the plan of the sanitary campaign and its execution. After an account of the legislative provisions and their application the authors come to the Official Sanitary Brigade and its work. It began with a force of 43, prisoners of war and delinquents sentenced to penal servitude, was slowly brought up, in the last year, to 300, and was at work for three years and a half. Each member received a fortnightly injection of atoxyl and "to this precaution may be attributed the small number of cases of infection among them, for between February, 1911, and August, 1914, only four men, out of four hundred or more who had served in the brigade, died of sleeping sickness. At this moment there are only seven sick among the ranks of the survivors." Here it may be doubted whether the authors are correct. Experiments have shown that the excretion of atoxyl is comparatively rapid. In the case of animals prophylactic experiments of the kind have failed and it is dangerous to assume that they would succeed in man. Unfortunately there are no details of the diet, condition of living, clothing, etc. of the brigade; such might throw light on the comparative immunity enjoyed. Nor is there any indication of the extent to which they were bitten. It is possible to work in *palpalis* areas and be very seldom attacked.

The chief steps taken were the clearing away of herbaceous and woody vegetation, the opening out to the sun's rays of the margins of water-courses and swamps, the straightening out and levelling of the banks and beds of these, the draining and filling of swamps, and forest fellings on a large scale. Two annual operations are advised—in the middle of the rainy season and at the end. The total area of land drained and reclaimed was 4 square kilos. Details are given. In one instance a tunnel was driven through a hill to drain a swamp. The area in which trees were felled exceeded 15 square kilos. As soon as the trees came down they were cut up into sections. The debris was rarely burned; its destruction was left to natural agencies; when such wood is burnt, "the secondary bush grows with an even greater rapidity and creates a more vigorous forest than if left to itself." Whether such is the case on the mainland the reviewer is unaware, but there are great objections to leaving timber on the ground, as has been found recently in Nyasaland [this *Bulletin*, Vol. 7, p. 111]. The trunks were cut at 40–60 centimetres above the ground. The stumps send out shoots in a very short time, "but if the precaution be adopted of cutting these shoots two or three times and stripping the stump of its bark, the tree dies, and the decomposition which sets in very soon works down to the roots." This should lessen the expense of clearing, because it has been recommended hitherto that the ground should be stumped. Trees were left at 6–8 metres interval on higher ground, 10–15 in sheltered positions.

The brigade, with the assistance of sportsmen, was responsible for the destruction of pigs, dogs, and civet cats. Of pigs 2,500 were slain by the brigade; at the end not more than twenty remained. Two thousand dogs and a still larger number of civet cats were accounted for. A cryptic reference is here made to the importance as a source of blood "attributed to the water-crow of the banks of the Victoria Nyanza."

Details are then given of the bird-lime method of trapping tsetse. [The sticky substance is referred to throughout as "viscus," which is surely nothing but the singular of viscera.] Its adoption was compulsory on every property and one man in ten of each gang of serviçaes had to wear the sticky cloths. These were made of black serge lined with canvas and measured 40 by 50 centimetres. The fly catchers were grouped in twos, one behind the other; an illustration reminds one of the well-known advertisement of a certain paint. The most serviceable preparation was that put up by Tunbridge and Wright of Reading in tins of 5 kilos. A

fresh application had to be made daily. The men were told to take off the cloths when it rained and to fold them with the sticky side in. Nearly half a million tsetse were thus caught in 1911–13 [see the table published in this *Bulletin*, Vol. 4, p. 354]. Fixed cloths were useless.

All domestic animals in the island were examined three times for trypanosomes. Treatment was found useless and the infected ones were slaughtered. With regard to human beings 11,338 examinations were made by the thick film method, and 268 cases of trypanosomiasis were thus diagnosed. These were treated with double injections of atoxyl for at least four months and records of each case had to be kept by the planters. In November, 1913, 176 old patients were selected as showing no signs of disease and 78, having passed a careful examination, were repatriated to Angola or Cape Verde; later 43 more were released. Fifty-five remain. It is stated that preventive injections of atoxyl, following the bites of the flies, came to have a more current employment in the island than was at first expected; the reason was that the two injections meant two days off.

The total cost of this campaign was 156,982 escudos, or about £23,550 [escudo taken as 3*s*. 1*d*.], about seven parts of which were borne by the planters and six parts by the State. The items of expenditure are classed as—works in the field, fly catching operations, medical officers and hospital assistants, animals slaughtered, mechanical protection of dwellings, stables, etc., atoxyl—arranged in the order of costliness. The cost is worked out at 5·23 escudos per annum per hectare, about half of which was paid by the planters. The average net production is put down as 25 to 50 escudos per planted hectare. The authors go on:—

"It would be no exaggeration to reckon at 20 per cent. the increase in value of most of the properties in the island, through the improvement in their sanitary condition, and to count upon an increase at the same rate, in the near future, in their annual revenues, thus compensating for all the money spent on them."

It is estimated that the maintenance of the work will entail a "maximum annual burden of 8,000 Portuguese dollars," or £1,200.

Part III. is entitled "The Results of the Sanitary Campaign." Taking the records of capture of tsetse by the Maldonado method as an index, the authors give a chart, which shows the number of Glossina caught month by month in 1911, 1912, 1913 and 1914. In the first two years there is a great depression in the curve in the middle of the year, due to the *gravana* or dry south wind, followed by an abrupt rise towards the end. In 1913 instead of this rise there was a continuous fall, the curve almost reaching the base line at the end of the year, though the staff was increased in October. The record comes to an end in May, 1914. It is pointed out that the more important sanitary works were not concluded till the beginning of 1913. Similar curves are given for the larger estates. Summing up the results, the authors write:—

"The principal methods of attack employed against the glossina in the island were three in number; the clearing of the vegetation so as to let the direct rays of sunlight get at the soil and the air circulate freely around the clearing; the drying of the swampy lands; and the extinction of the animals who used to lend themselves to the feeding of the insect.

"The direct hunting of the insect by means of sticky cloths has never, by itself alone, proved a measure capable of reducing appreciably its numbers in the places it mostly frequents, and still less can it be relied on to effect its extinction from the island. The value of the MALDONADO process lies principally in the protection it affords to the workers in the more dangerous places, and in the index it affords, within limits, of course, to the frequency of the glossina in the particular area dealt with, and to the efficacy of the other measures put into practice against it. By itself, within practical limits, inasmuch as it is comparatively expensive on account of the great number of men it demands, it must be an offensive weapon of very slight value, and unlikely to give any very definite result."

This clear pronouncement has been long waited for. There was reason to think that the members of the previous Mission considered this method of no little importance in the campaign. It now shrinks to its proper proportion. The cutting of the vegetation was the most effective method,

as has been found everywhere else, but the authors lay stress on the value of the extinction of the animals on which the fly fed. It is pointed out that when the cleared lands became again covered with scrub and jungle it was noticed that only those places became alive with Glossina to which the wild pigs returned.

Later in the book an "elongated variety" of *T. gambiense*, obtained from a patient in the Island, is described. The Correia Mendes Mission described a dimorphic trypanosome common in the mammals of the Island, which they suggested was *T. pecaudi*. This is judged from the description and comparison of specimens to be identical with the above variety of *T. gambiense*, a conclusion of much significance if it is correct.

As to the progress, or regress, of the disease, microscopic examinations in 1908 showed 26 per cent. infected; in 1911, 17 per cent.; in 1913, 7·7; and in 1914, some cases having been sent to Lisbon and old cases repatriated, 0·66 infected persons remained in the Island. A chart shows the general mortality and the mortality from sleeping sickness from 1902–14. With two temporary checks the general mortality curve comes steadily down from 221 per mille to 69 per mille and the sleeping sickness curve follows it, showing, as would be expected, how much the latter has contributed to the former. The other causes of death are discussed, with figures, and it is concluded that they have not diminished in the same way.

Part IV. deals with the sanitary future of Principe. While the authors write that "it can hardly be supposed that a single living specimen [of *G. palpalis*] remains in the island" and no cases of sleeping sickness have been diagnosed since the first six months of 1913,* they realize that more is required if what has been won is to be retained. They think that two of the members of the Mission may now be dispensed with, and the brigade reduced to 60 men and a European overseer, and that after six more months the medical and sanitary duties might be transferred to the two medical officers of the island. They indicate the main provisions of a law which they desire to see passed, from which it is evident that they are not unprepared to find the tsetse fly again becoming evident; e.g. they would prohibit pig breeding, and allow no thick forest to exist under 200 metres elevation.

The rest of this part deals with general sanitation, the authors observing that the death-rate is still very high. They deal in turn with the housing of the serviçaes on the estates, their diet, disposal of faeces, rules affecting labour, alcoholism, medical attendance, malaria, inspection at port of embarcation, vaccination, and imported infectious diseases. Under housing, they note that influenza, pneumonia and pulmonary tuberculosis cause an annual mortality of 10 per mille, which they attribute mainly to common dormitories and their imperfect ventilation. They note that marriage is as a rule not permitted; this they regard as a mistake. They suggest better arrangement of the barracks and separate dwellings for married couples. Dejecta are dropped indiscriminately; latrines are almost unknown; intestinal worms are a frequent cause of admission to hospital. They suggest latrines on the dry earth trench system, the extensive use of thymol and the prevention of ground itch by some form of foot-gear, which would also prevent small wounds that often result in large intractable ulcers. For malaria they advise quinine prophylaxis, which also they think would lessen the incidence of leg ulcers.

Part V., by Dr. J. Firmino Sant'Anna, deals with the species of trypanosomes found in the island, the blood-sucking insects, and the intestinal flagellates seen in *G. palpalis* and in Tabanids. An appendix gives an Order in Council, dated June, 1915, embodying the recommendations of the Mission for keeping Principe free from sleeping sickness. Large scale maps show the former foci of *G. palpalis*, the areas treated by the different sanitation measures, and the percentage of infection in the five zones, into which the island was divided, in 1909, 1911, 1913 and June 1914 respectively. The book is profusely illustrated with photographs, which give a good idea of the vegetation. There are also several coloured plates of trypanosomes.

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*In a note at the end of the book it is stated that two cases were detected in September 1914; both had been in residence four years.

This work is a valuable contribution to the literature of the prevention of sleeping sickness and the details should prove most useful to sanitary officers engaged in this task in our African possessions. While one must not forget the three special conditions of Principe—that its area is small, that it is an island and hence completely cut off from other fly areas, and that the native inhabitants are more completely under control than is the case in many parts of the mainland—the achievement of the Bruto da Costa mission is a great one, of which the planters will reap the benefit in increased production and decreased expenses of management.

The translator has done his work carefully but there are obscurities in places, doubtless due to his unfamiliarity with the technical terms.

A. G. B.

AUSTRALIAN INSTITUTE OF TROPICAL MEDICINE. Collected Papers. No. 1. 1914. Townsville.

The Collected Papers of the Australian Institute of Tropical Medicine, Vol. 1 of which has recently been issued, consist of nineteen reprints of varying format bound together. Half of these have been noticed in this *Bulletin*; the rest are chiefly zoological and deal with helminths and mosquitoes. The authors are A. BREINL, H. PRIESTLEY, S. J. JOHNSTON, W. NICOLL, T. H. JOHNSTON, F. H. TAYLOR, W. J. YOUNG and J. W. FIELDING. It is convenient to have the papers in this form, as many were published in journals which are not readily accessible.

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